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Original Articles.

RELATION OF DULNESS TO CARDIAC OUTLINES.*

BY GEORGE CHEEVER SHATTUCK, M.D., BOSTON.

IN recent years the tendency has been toward outlining the heart by means of light percussion. Heavy percussion has been discarded except by a few. The multiplicity of methods of percussing which are still recommended points to the conclusion that none is satisfactory.

In order to compare the results of different methods it is necessary to have a means of checking percussion outlines, and the x-ray offers the best means. Percussion as generally employed consists of two processes carried on simultaneously. The first is the detection of diminished resonance; the second is judgment as to whether or not this change corresponds with the heart-border. Accurate weighing or measuring involves no such dual process. It practically eliminates the subjective and the result is almost purely objective. Percussion is largely subjective because judgment is an important factor in the result.

I have attempted by teleoroentgenography to check ordinary light percussion, using it objecively with reference to sound, disregarding resistence, and abstaining, as far as possible, from allowing knowledge of anatomy or other evidence to influence the result.

Before taking the x-ray, the outlines of slight diminution of resonance (*i.e.* slight dulness) were determined by light percussion and marked with wires stuck to the chest wall with adhesive plaster.

The slides which I shall show were prepared from x-ray plates taken with the tube at from six to seven feet from the plate to avoid magnification by giving nearly parallel rays. The plate lay against the patient's chest, in front, the tube was behind him. The patient was standing and the pictures were taken at mid-respiration, not full respiration because the latter alters the relation of the heart to other structures.

FACTS ILLUSTRATED IN SLIDES.

Slides Nos. 1, 2 and 3 show that the outer limits of very slight dulness do not correspond closely with the heart-borders as seen in the x-ray.

Slide No. 4 shows that neither very slight dulness, moderate dulness nor flatness alone serves to outline the heart.

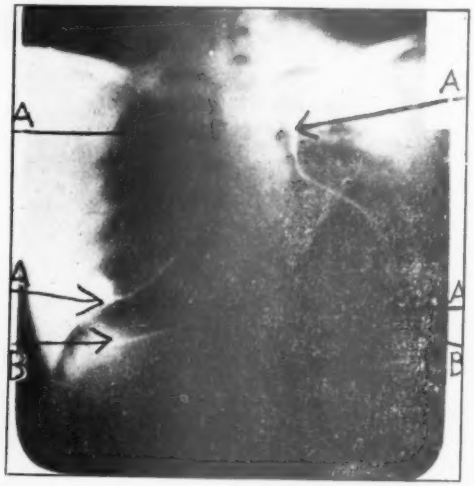
Slide No. 5 shows that even when the chest is large and of average proportions, definite dulness appears on the left lateral curve with a heart of normal size.

Slide No. 6 shows that the location of the borders of the heart may be judged pretty accurately by percussion plus other methods of examination, but that the greatest difficulty is at the apex when we want our outline to correspond with that seen in the x-ray plate, and that this difficulty exists even when the chest is large and broad.

* Read in part at the meeting of the Mississinpi Valley Medical Association, Lexington, Kentucky, October 19, 1915.

Simultaneous publication by courteous permission of the *Lancet-Clinic*.

Slide No. 7 shows that a very accurate estimate of the position of the heart can be made in a large and well-proportioned chest even when the outline of very slight dulness is quite different from the x-ray outline.



SLIDE No. 1.
Lines AA indicate very slight dulness determined by percussion.
Line BB shows absolute dulness: dotted in part.
Chest broad, but heart moderately enlarged.
Apex sixth space.

Slide No. 8 shows an equally successful cardiac outline in an abnormal chest with an unusual type of heart. The apex impulse gave the best evidence of the position of the left border in this instance.

SLIDE No. 2.
Lines AA indicate very slight dulness.
Lines BB indicate moderate dulness.
Chest small and rounded. Heart of normal size, but dulness to left extends onto the side of the chest, so that part of the lateral chest wall lies between the marker and the cardiac apex, which makes the percussion appear less accurate than it is in fact.

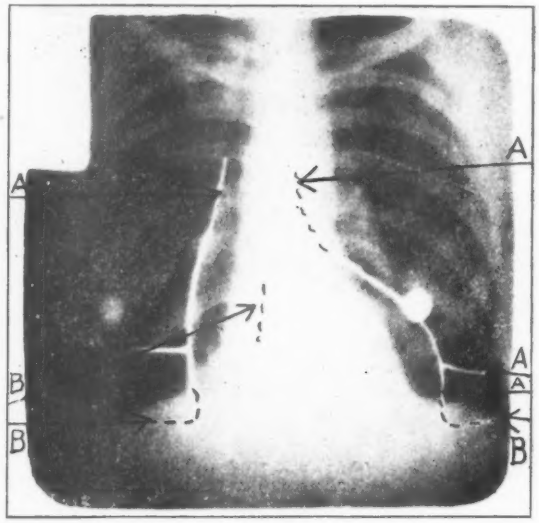
DISCUSSION OF SUBJECT.

My outlines of dulness do not correspond with the silhouette outlines of the heart as shown in the x-ray. The reasons for this fall into two groups:

First, relative dulness near the heart may be produced by structures other than the heart.

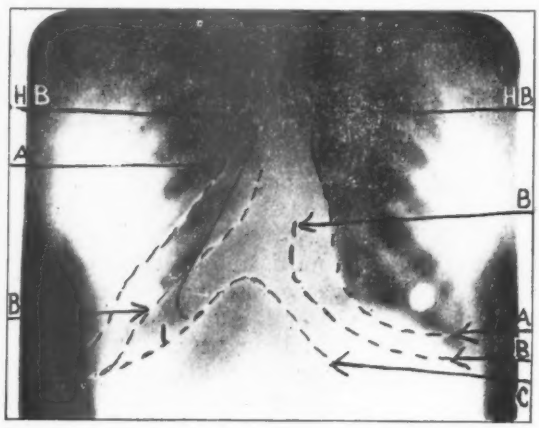
Second, slight cardiac dulness, even when the heart is of normal size, generally extends toward the axilla, so that outlines which follow closely the borders of slight dulness fall of necessity upon a curved surface.

To expect such an outline to correspond on the left with the shadow of the heart produced by parallel rays on a flat surface, or with an orthodiagraph of the heart would be unreasonable. A square peg can be fitted to a round hole



SLIDE No. 3.
Lines indicate slight dulness and moderate dulness as in No. 2. Wires dotted in part.
Chest very narrow in front so that dulness extends onto the curve of the side both to right and left.

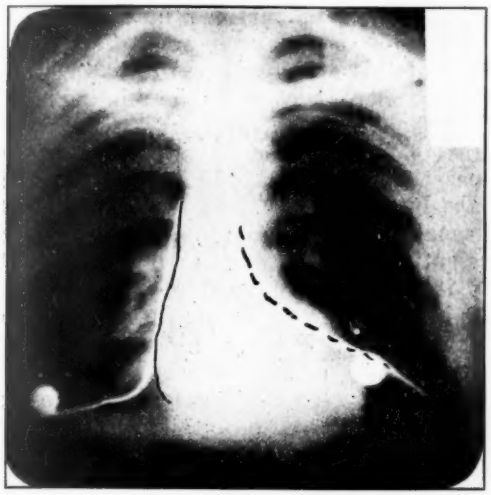
by whittling it down. Similarly, it is possible to obtain an outline of the heart which will correspond with the x-ray shadow, but to do this the



SLIDE No. 4.
Shows relations of three degrees of dulness to heart-borders in a narrow chest.
AA—Very slight dulness: wire dotted.
BB—Moderate dulness: wire dotted.
CC—Absolute dulness: wire dotted.
HB—Heart border.

lines of slight relative dulness must be abandoned in part, and the markers must be replaced

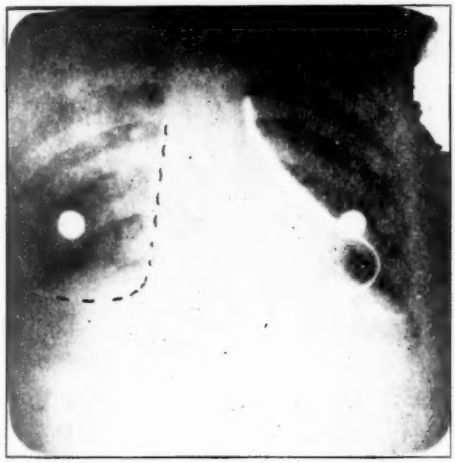
with due regard to peculiarities of resonance,—which experience teaches one to expect in the individual under examination. When making such an outline, the sense of resistance in percussing, and the position of the apex impulse as shown by palpation are helpful, and familiarity with the common types of heart-outline as seen in the x-ray is important. In other words, when attempting to make percussion conform to the x-ray, it is well to obtain information not only from slight changes of sound but also in other ways.



SLIDE No. 5.

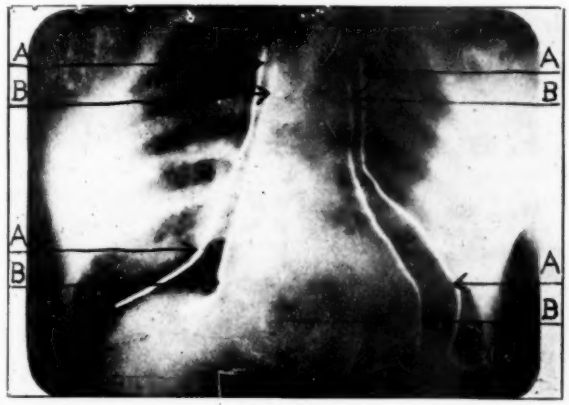
Chest large and of average proportions, and yet dulness to left extends onto curve of side. Heart normal in size.
Lines indicate *slight*, not very slight dulness.
Right border marked with line.
Left wire dotted.

The fact that the percussion-outline of slight dulness does not correspond near the apex to the x-ray outline does not signify that the percussion-outline of dulness is wrongly placed. *Slight dulness* on a curved surface cannot correspond with the x-ray at this point *when ordinary light percussion* is used.[9] It gives a magnified outline of the heart (Fig. 2). The border of marked dulness, or that of flatness on the left, comes much nearer to it and, therefore, these should be used as guides when attempting to make a silhouette outline of the heart. The palpable impulse can then be used as a check.



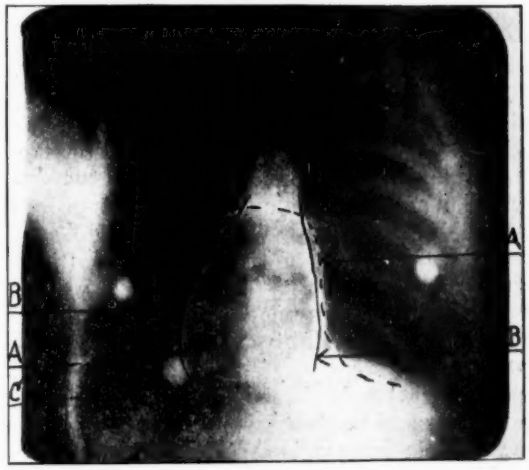
SLIDE No. 6.

Lines indicate *not* percussion outline but judgment as to probable position of heart-borders. Judgment was based not only on percussion but also on other evidence obtained by physical examination.
Dulness to left again extends to curve of side, and in placing the wire at this point not enough was allowed for this fact.
Wires at other points follow the heart-border very closely.
Chest large and broad.



SLIDE No. 7.

Lines AA indicate very slight dulness.
Lines BB indicate judgment of probable position of heart-borders based not only on percussion but also on other evidence. Border coincides.
Chest large and well proportioned.
Fig. 2 from same case.



SLIDE No. 8.

Lines AA indicate very slight dulness. Wire dotted.
Lines BB indicate judgment of probable position of borders. Wire marked with line. Border coincides.
Circle C shows palpable apex impulse which helped to locate left border correctly.
Chest small and very narrow in front. Heart of "drop-like" type.

By using such combined methods I have often obtained outlines of the heart corresponding closely with the x-ray, but it is difficult and success in my hands is uncertain.

Locating the right border is much easier, as shown by the work of Dietlen,[1] Treupel,[2] and others, but even Treupel, whose results are the best I know of published in original measurement, was content to count as correctly outlined cases in which errors occurred of less than one

centimetre. Personally, I am often in doubt as to the position of the right border of the heart and therefore rely on several signs rather than on slight dulness alone. The extent of absolute dulness to the right, or accentuation of the pulmonic second sound, may give evidence of enlargement.

It seems to me, therefore, a mistake carefully to measure ordinary percussion outlines and to draw inferences from them alone as to the pres-

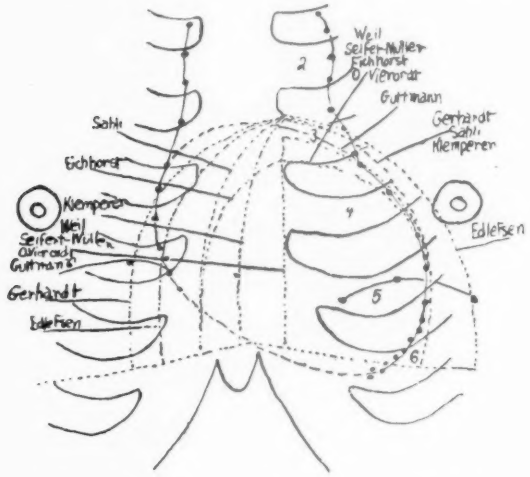


FIG. 1.—From Moritz: Deut. Arch. f. klin. Med., Vol. 88, p. 277, '06-'07.

ence or absence of slight enlargement. To do so is to assume a degree of accuracy not attainable with certainty.

I believe that the findings of ordinary percussion should be recorded in the terms of their relations to anatomical lines, such as the parasternal line on the right and the mid-clavicular or anterior axillary line on the left and to interspaces. A record of this sort is scientific because it represents facts, and it is more useful for judging of the normality or abnormality of the heart than is a measurement which does not take into account the weight of the patient or the shape of his chest.

As a general rule, broad hearts are found in broad chests and narrow hearts in narrow chests. Heavy people have relatively broad chests and large hearts, and thin people relatively narrow chests and narrow hearts or broad, flat chests with wider hearts. In these types the shape and position of the normal heart seem to bear a pretty constant relation to the shape of the chest; and it is, I think, for this reason that interspaces and anatomical lines are valuable as indices of heart size.

Measurements from ordinary percussion are useful to compare changing conditions in an individual at different times, or in conjunction with descriptions of the relations of dulness to interspaces, mid-clavicular line, and the like. Recorded measurements should always be made with the patient in the same position and in the same way, and it should be known in what position they were made, and whether around the chest to the left, or from a perpendicular from the frontal plane to the line of dulness on the chest-wall. Compare ML X and ML Y, Fig. 2.

Measurements of percussion outlines on the left to fractions of a centimetre are not scientific because they imply a degree of accuracy which ordinary percussion cannot yield with reasonable certainty.

When using percussion to determine heart-size it is not necessary to be content with a single outline of dulness. One can determine the limits of slight dulness, of moderate dulness, and the borders of superficial flatness, and at the same time take note of varying degrees of resistance. The sum of this evidence gives to a certain extent a stereoscopic picture of the relations of the heart to the chest-wall, and from this, conclusions as to its size and shape can be drawn. Whereas the findings should be compared, not with absolute heart-size, but with standards of the normal based on individual experience, it is not essential to determine absolute heart-size, nor is it necessary that all physicians should percuss in the same way or that they should make the same outlines. When examiners are equally experienced and equally expert, their conclusions as to the presence or absence of demonstra-

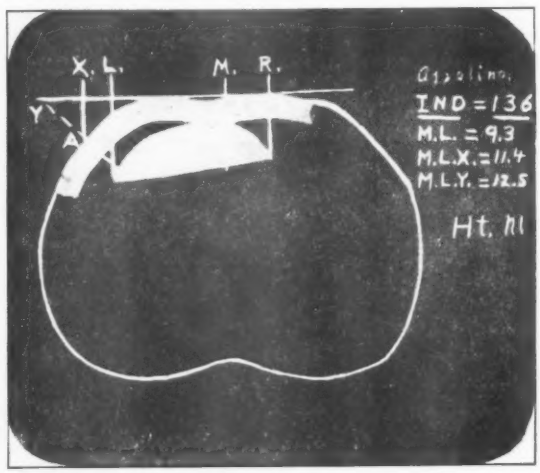


FIG. 2.—M.L.=9.3=actual measurement from x-ray plate.
M.L.X.=11.4=perpendicular measurement to dulness on chest-wall.
M.L.Y.=12.5=measurement around chest to same point.
Chest index=1.36. Average index in 34 cases=1.33.
Therefore, this chest is of nearly average shape. The case is the same as that from which Slide No. 7 was made.
Distances from anterior plane to apex, front of heart and right border were taken from average measurements from six frozen sections. M.L. and M.R. are the actual measurements from the x-ray plate.

ble enlargement are likely to coincide even though their methods be very different. Before the advent of the x-ray, few attempted, or expected, to make on the chest a silhouette outline of the heart by means of percussion. The great variance in the teaching about the percussion outline of the normal heart was shown by Moritz[3] who published an excellent diagram of the heart with superimposed curves of cardiac dulness

from standard authors (Fig. 1.) There seems little reason to doubt, however, that these eminent clinicians were as competent as most of us to detect enlargement of the heart by percussion. It does not follow, however, that they were able to discover comparatively slight enlargement, or that their methods were equally good, or that they had a definite idea of the relations of their outlines to the actual heart-size. To do these things without the aid of the x-ray would have been most difficult, but they can all three be done now with comparative ease.

Moritz,[4] Dietlen,[1] Treupel,[2] and some others who worked much with the orthodiagraph seem to have assumed that it was the function of percussion to provide a silhouette outline of the heart which could be measured like an orthodiagram, so that the measurements could be compared with standards based on orthodiagraphic work. They succeeded by special methods to a surprising extent in accomplishing this object, and their methods should be generally adopted if they prove to be practicable for general use. Not having had the opportunity as yet to give these methods a fair trial, I am not willing to condemn them, but neither am I convinced that they would be valuable in the hands of men less expert in their use or less familiar with orthodiagraphic work than were the advocates of these methods. The methods in question are that of Moritz,[6] a modification of light finger percussion, the "touch percussion" of Ebstein,[7] and the "threshold percussion" and "orthopercussion" principles of Goldscheider.[8]

I am inclined to doubt the wisdom of generally adopting these methods because they seem to me to add more difficulties to an already complex problem, and because they tend to give the impression of greater accuracy than necessarily exists. I mean to discuss at another time the percentage of error and the limits of error of these methods when used by the most expert.

CONCLUSIONS.

The following conclusions seem warranted regarding ordinary percussion:

First: It easily reveals gross abnormality in cardiac dulness to right or left.

Second: It may suggest slight abnormalities which must then be confirmed or disproved by other means.

Third: When percussion indicates slight cardiac enlargement, or no enlargement, palpation, auscultation, blood-pressure, or history may provide further evidence of importance which can be used to check the results of percussion.

Fourth: When doubt still remains, teleoroentgenography or the orthodiagraph may be of service; but it should be remembered that variations of heart-size are dependent on many factors, and that the average man does not exist. Moreover the errors of these methods in the hands of one who does not appreciate their difficulties, when applied to the heart, are large.

Fifth: Percussion is especially unreliable for finding slight enlargement of the aortic arch, for determining the level of the apex, and for discovering hypertrophy of the left ventricle when there is little or no dilatation. Palpation in the left lateral position is often helpful for solving the last two problems, and accentuation of the aortic second sound, or increase of blood pressure should not pass unobserved.

Sixth: It is not worth while to attempt by *ordinary* percussion methods to make a silhouette outline of the heart. It is better to note the relations of dulness in terms of interspaces and anatomical lines, and to compare the findings with a subjective standard based on experience, than to judge of enlargement by measurements of *ordinary* percussion outlines and comparison of them with orthodiagraphic standards.

Seventh: The attempt to make silhouette outlines of the heart by means of special methods of percussion has shown, in the hands of a few, results which are good but more or less uncertain.

Many thanks are due to Drs. Walter J. Dodd and George W. Holmes for help and for valuable suggestions as well as for doing the x-ray work upon which my studies were based.

REFERENCES.

[1] Dietlen: (a) Deut. Arch. f. klin. Med., Vol. 88, p. 55, '06-'07; (b) *Ibid.*, p. 287; (c) Verhand. d. Cong. f. Inn. Med., Vol. 23, p. 267, '06.
[2] Treupel: Münch. med. Woch., Vol. 54, p. 972, '07.
[3] Moritz: Deut. Arch. f. klin. Med., Vol. 88, p. 277, '06-'07.
[4] Moritz: Deut. Klinik.
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[6] Moritz: Verhand. d. Cong. f. Inn. Med., Vol. 19, p. 524, '01.
[7] Ebstein: Die Tastpercussion. Stuttgart, 1901.
[8] Goldscheider: Deut. med. Woch., Vol. 31, p. 333, '05.
[9] Shattuck: Boston Med. and Surg. Jour., Vol. 170, p. 190, '14.

NEUROLOGICAL SURGERY IN A WAR HOSPITAL.

By Elliott C. Cutler, M.D., Boston.

Resident Surgeon, Harvard Medical School Unit, American Ambulance, Paris, April, May and June, 1915.

Of the total 441 cases under our care during the three-month service in the American Ambulance Hospital, Paris, 64 cases or 14.5% of the total presented lesions of essentially neurological interest. There were 67 different lesions in the 64 cases. The injuries in a majority of all cases were very similar to those seen in civil life in any active accident-ward service, only the destruction of tissue as a rule was far greater. The problems presented by gunshot injuries of the head are those of any compounded cranial fracture plus the possibility of a retained foreign body, and those of peripheral nerves concern the immediate care of the wound and judgment as to how long to wait before doing an aseptic secondary operation.

Although the period during which we observed these cases was brief, and improvement after injuries of the nervous system is often slow, still in this group of cases recovery after operation, even for badly lacerated wounds of the brain, occurred in a surprisingly short period of time.

We have divided the cases into five distinct groups following the natural anatomical divisions. These groups include lesions of the cerebrum, cerebellum, spinal cord, sympathetic nervous system and peripheral nerves. There were 15 cerebral lesions, 3 cerebellar, 7 of the spinal cord, 1 of the central sympathetic, and 39 of peripheral nerves. Of the total number of cases in this series, 25 underwent operation. The majority of these cases had been subjected to some previous surgical measures of one sort or another, though a few men with cerebral injuries reached us with the original simple "pansement" of the "Poste de secours" still in place.

The missiles causing the injuries were divided as follows: rifle ball 32, shell fragment 20, shrapnel ball 6, bomb fragment 2, shell explosion resulting in the caving-in of a trench or hut 4. In addition, 2 musculo-spiral nerve paralyses were due to fracture from falls without wounds. The types of wounds were: perforating 25, penetrating 7, and simple wounds 26. In this summary are not included simple skull injuries without neurological symptoms, of which there were several examples.

I. *Cerebral Injuries.* In this series there were 15 cases with definite neurological symptoms. One was a simple concussion without fracture received in a mine explosion. There were the usual symptoms of disorientation, perturbation and shock which soon cleared up. There was one fractured skull with slight bony loss due to a gutter fracture by a rifle ball with some depression of the inner table. In this case the injury was almost exactly at the mid-point of the vertex and there was the peculiar spasticity of the lower limbs and increased reflexes characteristic of injuries in this region, so thoroughly described by Sargent and Holmes[1] in a recent article.

There were 12 cases with a loss of bony substance. The cerebral regions injured were as follows: occipital 2, frontal 2, low parietal 5, and high parietal (vertex) 5. In 9 cases there were distinct localizing symptoms. Thus both of the occipital wounds were associated with loss of vision in a varying degree and in one (Fig. 1.) in which one occipital lobe was almost entirely destroyed, there was a homonomous hemianopsia. In 6 of the 10 parietal cases there was a temporary but fairly complete hemiplegia and in one case of left parietal laceration (Fig 2.) a complete aphasia accompanied the hemiplegia. Headache was present in every case and a measurable choked-disc in 8 of the 15 cases (Fig 3).

[1] Holmes, G., and Sargent, P.: British Medical Journal, Oct. 2, 1915.

FIG. 1.—J. P. Shell-fragment wound, destruction left occipital lobe; four weeks after injury. Homonomous hemianopsia.

Seven of the cerebral cases were operated upon. In only 3 was a foreign body recovered. On two occasions the magnet was successfully used to extract the missile and no anaesthetic was necessary. The first of these had been previously trephined and there was an opening on

FIG. 2.—H. L. Two weeks' post-operative, showing curved incision to permit decompression and exploration of wound of brain; drained.

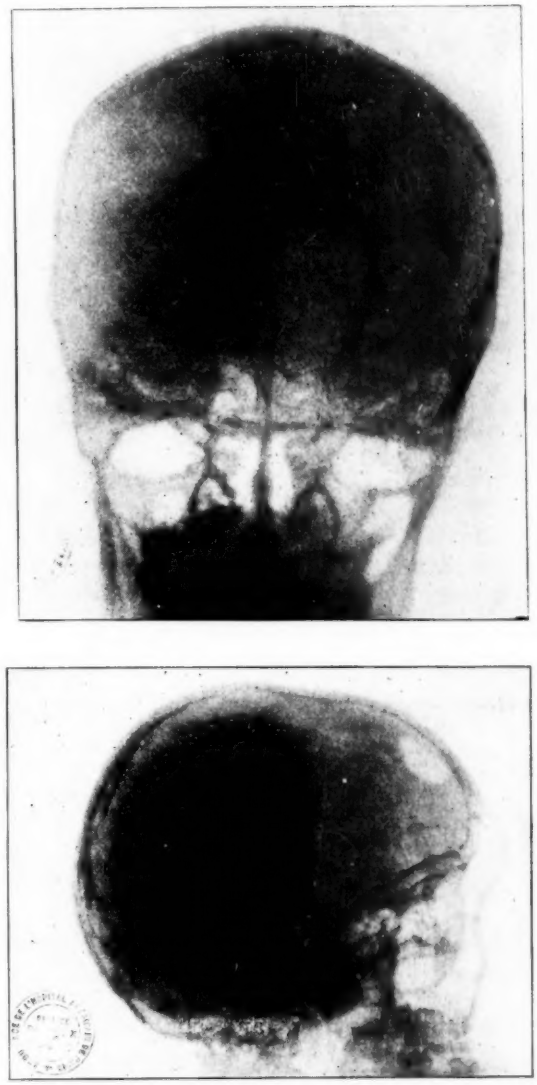
the vertex about 1 inch in diameter. The patient entered the hospital 3 weeks after his injury and had headache, a slight degree of choked-disc and some temperature and leucocytosis, evidently signs of a small abscess. Some 6 cm. below the inner table a small piece of shell fragment was disclosed by the fluoroscope. Under ether the foreign body was felt but could not be easily grasped, but was easily extracted with the magnet. The wound was drained and the patient made a perfect recovery.

FIG. 3.—F. Two weeks' post-operative, showing subtemporal decompression incision through which brain was cleaned up and original site of injury which was drained.

The second of these cases (Figs. 4 and 5) was more difficult as the shell fragment was found to rest close to the anterior clinoid processes, though it had entered at least 10 cm. distant in the upper frontal region. Under the fluoroscope and without an anaesthetic a blunt probe was inserted until it was seen to rest at the foreign body. The magnet was then brought to the probe and the latter extracted. No fragment accompanied it. A second and third trial was made without success, but on the fourth attempt the small bit of iron was withdrawn, adhering to the magnetized probe.

In the other cases a modified decompression operation was performed, the chief object at operation being to remove scattered bony fragments and relieve pressure. All wounds were carefully closed in layers and drained by small pieces of gutta-percha tissue. Constant daily dressings followed and formed a most important part of the treatment, for by this care subsequent infection was obviated and herniae avoided.

The results were as follows. (1) Among the operated cases there were 2 deaths from meningitis, 5 recoveries and return to a practically normal state—these cases may be called cured. The aphasic soldier began to speak 10 days after his operation and in the 4 hemiplegias perfect motor control was regained within 2 to 4 weeks. (2) Of the unoperated cases 5 showed improvement with careful dressings, massage and exercise. In all, 3 were left with a permanent disability; one in which an occipital lobe had been blown out was left with a permanent homonomous hemianopsia; one right parietal injury developed slight Jacksonian attacks, and the last with a bullet wound through the base of the skull developed an extreme ataxia and epileptic seizures at a late period. The two deaths occurred in cases with very extensive brain



FIGS. 4 and 5.—H. L. Antero-posterior and lateral views of a small shell fragment just above the anterior clinoid processes; opening in skull in upper frontal area; fragment removed by magnet.

lacerations which were badly infected when admitted.

The one case of concussion without bone injury was the only example in our series of psychical shock experienced by some of these men. In its more exaggerated forms they go into a stupor and for days live in a condition of hebetude and katatonia much similar to cases of dementia praecox. These patients are dumb, listless, inactive, apparently seeing and hearing nothing. They appear as automata and will eat if a spoon is placed in their hands, but never speak.

II. *Cerebellar Lesions.* Of these we had 3 cases, one a pentrating, one a perforating wound, the third a tangential groove of the lower occiput. In all 3 cases localizing symptoms were present; ataxia, positive Romberg and muscular weakness, in one nystagmus; headache in every

FIG. 6.—R. H. Shrapnel ball in subdural space, occipital fossa, left side; successfully removed.

case, and in two a measurable choked-disc. In one case there was a temporary amaurosis due to concussion of the neighboring occipital lobe. Two cases underwent operation. In one a shrapnel ball was removed from the extradural space. In another a perforating wound had occurred in which the bullet must have just missed the sinus, and a great number of fine bony particles were removed from the lacerated cortex and even from the sinus wall. The patient carrying the shrapnel ball (Fig. 6) was interesting in that he seemed perfectly normal except for a small granulating sinus behind his left ear and was about to be discharged. A routine x-ray revealed the missile apparently in the cerebellum. There were no outspoken cerebellar symptoms, though if the head was violently shaken or the patient whirled suddenly a distinct Romberg, vertigo, and slight nystagmus were elicited. All 3 cases made uneventful recoveries except for a temporary cerebrospinal leak in the unoperated case, and they have doubtless long since returned to active service.

III. *Spinal Cord Lesions.* In this group are 7 cases. Two were complete divisions of the cord by a rifle ball and in all but one there was bony injury. Four cases were classified as hematomyelia, two of these having entered the hospital within 3 days after their injury. In one several shell fragments had lodged in the upper cervical region and a few of the larger pieces had been removed. He was paralyzed and anaesthetic from his neck down, a characteristic hyperaesthetic collar surmounting the anaesthetic field. Another case had been buried up to his neck by a mine explosion. When exhumed he was found paralyzed and anaesthetic from the nipple down on one side and below the umbilicus on the other. Increased reflexes were present in both cases. The latter case with massage and rest improved very rapidly and in two weeks was up walking. The other case improved more slowly, and, as we suspected a broken lamina at least, had to be handled with great care. With massage and exercise first sensory and then motor return began and a few weeks ago he wrote me that he walked out of the hospital unassisted. A third case had a dislocation crush of his second lumbar vertebra due to caving-in of a trench after a shell explosion. He showed complete paraplegia and sensory loss from his waist down. After 3 months, motor and sensory return were complete except for a residual paralysis of the peroneal group of one leg, where there had been some actual destruction of anterior horn cells. Of course no operative interference should be attempted in any spinal injury where such a condition is suspected.

Of the other spinal injuries there were two with complete division of the cord by a rifle ball. One had suffered with terrific root pain, lancinating and unbearable, for months. The injury was at the second lumbar spine. As an act of mercy the cord was completely divided about one and one-half inches above the lesion with incomplete relief and in all probability a higher section should have been made. In still another case a small piece of shell fragment passed through the left lower jaw fracturing it and cutting the facial artery; continuing, it passed across the neck lodging in the intervertebral disc between the second and third cervical vertebrae. Here it started up a fatal meningitis.

In all, 4 of the 7 cases were operated. Two had laminectomies and 2 local exploration of the wound. In 2 cases a foreign body was recovered. As results 2 died, one from meningitis as mentioned above and one of the complete divisions of the cord succumbed to toxaemia and renal sepsis after some weeks. His spine was crushed in the mid-thoracic region, and for weeks he had suffered from excruciating visceral (abdominal) pains. A sacral decubitus and severe cystitis followed and speeded a long hoped for death and relief. Four cases were greatly improved, all in the hematomyelia group already mentioned.

IV. *Sympathetic Nervous System Lesions.* There was one case that had had an injury in the neighborhood of the spinal sympathetic nervous system and which showed a small pupil on one side and some peripheral disturbances as sweating and color changes in the skin.

V. *Peripheral Nerve Lesions.* This comprises a large and varied group containing 39 separate lesions which have been divided as follows:

Musculo-spiral nerve injuries	10
Median	5
Ulnar	3
Facial	4
Brachial plexus	3
External popliteal	5
Internal saphenous	2
Circumflex	1

Patheticus	1
Amputation neuroma	1
Sciatic	1
Crutch paralysis	1
Protopathic disturbance of the hand	2

In 22 of the 39 cases the nerve lesion was the accompaniment of a skeletal injury and in all of the musculo-spiral injuries but one there was a compound fracture of the humerus. We have included sensory as well as motor nerve lesions and we inherited from our predecessors from the Western Reserve University three cases in which sensory nerves had been sutured before our arrival in Paris. The symptoms were the usual ones of motor disability and anaesthesia over distinct areas and they showed the curious formicating sensations, protopathic disturbances and trophic changes that sometimes accompany peripheral nerve lesions. Twelve of the 29 cases were operated upon, as follows:

Musculo-spiral	freeing from scar 2; suture 2
Median	freeing from scar 1
Ulnar	suture 1
External popliteal	suture 2
Internal saphenous	suture 1; freeing 1
Brachial plexus	freeing from scar 1
Facial	suture 1

Of the 27 unoperated cases 18 showed rapid improvement and there doubtless was no anatomical gross lesion despite the apparent paralysis. Many have observed the great frequency of paralyses without general anatomical findings and one should be conservative in operating upon such cases and should use electrical stimuli to differentiate true and false lesions. Injuries may so contuse nerves as to cause failure of function.

Except where nerves that were intact were merely freed from scars, the end results on the operated cases cannot of course be foretold. The cases in which a nerve was caught in a scar or callus and freed by operation have already shown marked return (2 musculo-spiral, 1 median, 1 brachial plexus and 1 internal saphenous).

Other than operative treatment we used massage, electricity and various forms of splints to maintain position till function should return, thus hoping to avoid muscular contractures and joint disabilities.

To summarize the total results. Forty-six cases were improved—10 unimproved. These latter were chiefly nerve sutures, the results of which cannot as yet be foretold. Four cases were cured or returned to a practically normal state, and there were in all 4 deaths. The cases were very carefully studied, operations were done under conditions almost as favorable as those in a hospital in times of peace, and the after treatment was followed in great detail.

THE PRESENT STATUS OF GALL STONE DIAGNOSIS BY THE ROENTGEN RAY.*

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No longer ago than March, 1913, Mr. Thurston Holland[1] wrote, "A survey of the literature of radiography furnishes very few instances of successful results as far as the accurate detection of gall stones by x-ray is concerned. Here and there a few instances have been reported when shadows have been obtained in suspected cases and where, at the operation which followed, gall stones have been found. It is recognized, however, by all radiographers that in a great number of these cases it is impossible to get any shadow of gall stones on a plate or to see any shadow on the fluorescent screen," while as recently as March, 1915, Cole and George[2] declare categorically, "it would now appear we can show them (gall stones) in all cases where they are present."

All roentgenologists may hesitate to say that their success in gall stone diagnosis is one hundred per cent. However, it has been borne in upon all of us that, with a proper technic and tireless effort, gall stones can be shown roentgenographically so much more often than formerly that the intimate coöperation of the profession should be solicited for the perfecting of this diagnostic aid.

Nearly all the earlier writers on the subject agree on the impossibility of detecting gall stones by the roentgen rays. Even so remarkable a technician as Albers-Schonberg writes in 1914 that nothing has been achieved of significance in the diagnosis of gall stones by the Roentgen ray.

Only a very few expressed themselves from the start more favorably. Carl Beck of New York showed the first plates of gall stones at a meeting in that city in 1899. He detected two large stones in the gall bladder, three smaller ones in the liver and one in the cystic duct. In several later publications, the latest in Groedel's Atlas (1910), he continued to express himself optimistically without, however, carrying conviction, thinks Panner[3], inasmuch as his observations seemed essentially based on the examination of extracted gall stones.

In 1904, Kohler[4] demonstrated a large gall stone the character of which he substantiated by repeated examinations. Mikulicz,[5] writing in 1905, believed a positive result seldom attainable, but, with wisdom, refused to forecast the future. In the same year Holland[6] published his first gall stone case, accompanied by illustrations. He found a ring-like shadow in the right upper hypochondrium, but he did not interpret it as gall stones since he had never before seen anything similar. At operation two large gall

* Read before the Brockton Clinical Society, December 7, 1915.

stones were found in a gall bladder empty of fluid. The shadows of the two stones had evidently overlapped in the roentgen examination.

From Königsberg, in 1906, came a lengthy article by Matthias and Fett.[7] They reported two cases. On the roentgen plate was seen a marbled shadow which in form and position corresponded exactly to an enlarged gall bladder. They thought the shadows were from a bladder filled with stones. In one case this was confirmed at operation. The small stones that were extracted were found to consist largely of calcium carbonate. The other patient was not operated upon.

Gottschalk[8] published, in 1909, a case that showed three shadows within the liver which he diagnosed as gall stones. The patient did not come to operation. Before the American Roentgen Ray Society of Detroit, 1910, Pfahler[9] of Philadelphia reported three positive discoveries of gall stones. Haenisch of Hamburg, and Cole who participated in the discussion, each reported three positive diagnoses. De Quervain[10] found in the course of a stomach examination, to the right of the pylorus, a shadow, resembling a cluster of grapes, which he regarded as a group of small gall stones. At operation a number of small stones of irregular form consisting mostly of calcium carbonate was found.

Edling[11] brought up the question at the roentgen congress at Berlin in 1912. He reported two positive cases of his own and one from the Kommunehospitalet investigated by Fischer. This last is interesting in several respects. The patient gave a history of colic in the right side, with hematuria, and was referred for examination for kidney stone. In the location of the hilus of the right kidney was seen a homogeneous shadow about the size of a walnut. It was diagnosed as a renal calculus, but none was found at operation. At autopsy, a stone was found in the gall bladder in form and size corresponding to the roentgen picture.

In the plates shown by Edling were seen numerous intermingled ring-like shadows. In the ensuing discussion, Immelmann laid stress upon this ring-like form being the characteristic gall stone shadow and due, he said, to a peripheral layer of lime in the stone. Frankel stated his belief that this lime shell is the condition *sine qua non* for a positive diagnosis of gall stones and that one should guard against such a diagnosis when the shadow is homogeneous.

Holland[1] reported two new cases in 1913, that gave this ring-like shadow. This same roentgen appearance was noted by Jaugeas[12] in his published case.

Lewis Gregory Cole[13] of New York, May 8, 1913, before the Atlantic Medical Society, reported 20 cases in which he had made a diagnosis of gall stones directly or indirectly. Eleven of these were operated upon and the surgical findings concurred with the roentgen diagnosis. Eight cases in which there was direct evidence of biliary calculi were not operated upon.

James T. Case[14] of Battle Creek, June, 1913, at the annual session of the American Medical Association, stated, "In a thousand patients referred for gastro-intestinal disorders I have demonstrated gall stones by means of roentgenoscopy in almost five per cent. I believe I am safe in the opinion that when gall stones are present they may be demonstrated by this means in 40 to 50 per cent. of cases."

In March, 1914, Pfahler[15] declared, "Both Case and myself believe now that about 50 per cent. of gall stones can be demonstrated but that negative findings never can be interpreted as indicating the absence of gall stones. My records show positive findings in 74 per cent., but I believe in general one cannot count on more than 50 per cent. being demonstrable."

At about the same time, George and Gerber[16] of Boston published an article in which they say, "We believe that gall stones can be demonstrated by the roentgen ray in nearly every case of gall bladder disease of long standing where stones are really present"

H. J. Panner[3] read an admirable paper before the Danish Surgical Society, December 12, 1914, on gall stone diagnosis by the roentgen ray. His review of the European literature on this subject I have availed myself of freely in this paper and gratefully acknowledge my indebtedness. He reports eight positive diagnoses of his own and dwells at length on the ring-like shadow as being the characteristic roentgen picture of gall stone.

"If it can be regarded as settled," he writes, "that in a number of cases we can detect the presence of gall stones by the roentgen examination, it is just as certain that we shall most frequently get negative results of a sort to which there can be given no significance whatever." He feels that only a very small proportion of gall stones will offer favorable conditions for reproduction on the photographic plate, for he says, "Gall stones usually consist to a great extent of so considerable a quantity of organic substance that they cannot be differentiated from the surrounding tissues. To be sure, they nearly always contain inorganic ingredients, namely, lime adhesives, especially pigment lime and, less frequently, carbonic lime, but these are, as a rule, diffused through the whole stone so that their proximity is not capable of altering the conditions."

Cole[17] of New York presented a communication, February, 1915, on "The Detection of Pure Cholesterin Gall Stones by the Roentgen Rays" which changed his thought on the matter of positive diagnosis of such stones. He sought to determine how a variety of gall stones *extra corpus* would appear on the photographic plate when suspended in air, water and bile, as compared with a selected "keystone" fairly rich in calcium content. His results are summed up as follows:

"About 20 per cent. of the gallstones showed more calcium deposit than the keystone. About 26 per cent. showed a trace of calcium less than the keystone. About 54 per cent. showed practically no calcareous deposit, in other words, they were practically pure cholesterin.

"Eighty per cent. of the stones submerged in bile cast a shadow less dense than the bile surrounding them. This observation would seem to preclude the hope of a positive diagnosis of gall stones in more than twenty or twenty-five per cent. of the cases. But the cholesterin stones are so much less dense than the bile surrounding them that they appear like bubbles of air and when many stones are present the bile surrounding them appears more dense than the stones and gives the area of the gall bladder a honey comb appearance or the ring-like shadow typical of gall stones.

"I have made a definite or probable diagnosis of gall stones in thirty cases. In only one case was there the amount of calcareous deposit which six months ago I deemed necessary to justify one in making a safe diagnosis of gall stones. Sixteen out of the thirty cases have been operated upon. Of these sixteen cases, twelve were correctly diagnosed roentgenographically, three incorrectly diagnosed and one very provisional diagnosis was incorrect."

Beck, from the very start, believed such experiments gave the greatest hope for the future of gall stone diagnosis. Pfahler early experimented along this line but abandoned the method. Dodd and Holmes of Boston carried out a series of experiments similar to Cole's which they reported at a meeting of the New England Roentgen Ray Society last winter, from which they concluded that roentgenologists had been looking for positive shadows in their roentgenograms when, as their experiments would indicate, one ought to look for negative shadows, so to speak, at least in the case of stones rich in cholesterin. Arial George of Boston had in practice anticipated these findings as witnessed by the very remarkable series of gall stone plates exhibited by him at the annual meeting of the American Roentgen Ray Society in Cleveland, 1914. The majority of the plates exhibited by him showed nothing but these so-called negative shadows.

Cole and George[2] in March, 1915, published a joint paper in which they state, "after having considered that we detected them (gall stones) in fifty per cent. of the cases, it would now appear that we can show them in all cases where they are really present and that a positive diagnosis can be made in such a large percentage of cases where gall stones are present that the negative diagnosis has become far more important than it was previously considered to be."

At the annual meeting of the American Roentgen Ray Society in Atlantic City, September, 1915, George presented "Some Further Notes on the Roentgen Diagnosis of Gall Stones," in which he insisted that success was only a matter of proper technic. In a series of 54 selected cases reported by him, which were operated upon by eight different surgeons, a positive diagnosis was made in 30 cases and a negative diagnosis was made in 24. There were three errors in positive diagnosis. No case negatively diagnosed was found to have gall stones at operation. The error in diagnosis is thus seen to be less than six per cent. for the series and a ten per cent. error in positive diagnosis. That his negative diagnosis was 100 per cent. correct, is strikingly significant of the recent advance that has been made in the roentgen diagnosis of gall stones.

A variety of technic has been described by as many roentgenologists. This man prefers one method, that another. In reality neither is antipathetic to the other.

For preparation I believe catharsis valuable, and prefer an effervescing saline. Catharsis will help rule out food particles which have been mistaken for calculi, and the gas resulting from an effervescing saline, as has already been noted by observers, may very materially improve the definition of calculi. In Fig. 1 is seen a gas-distended bowel lying partly over the gall bladder. The stones in that portion of the gall bladder are seen much more defined.

FIG. 1

The patient should be fasting. Catharsis by mouth may be aided by an enema so that if artificial gas distention of the stomach or colon be necessary, it can be profitably done. George thinks that a full bowel may at times be an advantage, as when bismuth filled, since it has a tendency to immobilize the gall bladder.

Roentgenoscopy has absolutely no place in the direct diagnosis of gall stones, for reasons which I have shown elsewhere.[18] It may be of value when studying the indirect manifestations of gall bladder disease. Serial plates alone should be employed.

The patient should first be examined prone, the abdomen on the plate with the shoulders slightly raised as suggested by Beck, if the patient be stout, in order to decrease the costo-hepatic angle. Several plates should be taken in this position, then the manoeuvers of Pfahler

and Cole employed, such as bending the body sharply to the left and directing the rays obliquely through the liver using, if one wishes, the 8 by 10 piece of board as described by Pfahler, to bring the gall bladder closer to the plate, or the circular plate holder of Cole which can be pushed up under the gall bladder for the same purpose. My own belief and that of George is that such procedures are seldom necessary.

I use a fast, finely grained intensifying screen in all gall bladder work. It is important that one have a screen of fine grain, otherwise some shadows will be sure to be lost and more than one screen must be used in order to check one's results. The advantage of employing screens is that of time as well as intensification. It is fundamental in this work that the patient should not breathe during the exposure. Stout individuals may find it difficult to hold the breath even for a second, hence the reason for speed. The screen, too, will catch more surely the markings of the so-called soft gall stones. It is again of special value in the robust and corpulent where a long exposure on an unscreened plate would give rise to so much secondary radiation that the gall stone shadows would actually be lost in the fog.

Whether or not one employs one of the standard gas tubes or the Coolidge tube, may be a matter of choice. It is essential that one work with a soft tube that will stand up under repeated charges of heavy voltage such as one would employ when roentgenographing large subjects. Gall stone work is too painstaking for one to have to worry about cranky tubes. I have used two Coolidge tubes now for eight months past with the utmost satisfaction.

The position of the tube will depend upon the position and size of the patient but usually it is in a plane parallel to that of the patient's body. A small diaphragm and a small cone are very important factors aiding one's success in looking for gall stones. The small diaphragm tends to centralize the really important rays of the focal spot, while the cone delimits secondary irradiation.

One objection to the diaphragm and small cone is the fact that one may overlook stones in an abnormally placed gall bladder so that it is well not to confine oneself in one's search for stones to the commonly accepted location for them. They may be found anywhere in the lower or upper right quadrant and even to the left of the median line. A gall bladder lying over the sacrum containing stones was reported by the Mayo Clinic.

The time of exposure will be determined in part by the patient's size but it also may well be a matter of technic. Because of the variety of calculi and their consequent variation in density, it is well to make several roentgenograms that one would ordinarily consider under exposed or over exposed. Stereoroentgenograms, also, are not without their usefulness and may be requisite to a proper differential diagnosis.

One's success in gall stone diagnosis even may extend to one's method used in the darkroom, as called to our attention by Stewart[19] of New York. A satisfactory developer goes without saying. More than that, one may with advantage overdevelop certain plates while giving others their normal developing time. Plates that are too dense to be read may be reduced and in that way gallstone shadows detected in the process of reduction that would not be likely to be found in any other way.

The interpretation of the roentgenogram calls for the greatest skill and a broad experience. The plates should be read only when thoroughly dry. Direct illumination by the northern sky is often particularly helpful. If stereoroentgenograms have not been made, the superimposition of plates one upon the other, as suggested by Cole, will give a stereo effect and may be of some aid. That experience is a tremendous asset to successful diagnosis is witnessed by the number of roentgenologists who, under the impetus of the recent advances in gall stone diagnosis, have gone back over their old plates of the gastrointestinal tract and gall bladder region in which they have reported no evidence of gall bladder calculi, only to find on restudy very definite evidence.

Interpretation is intimately bound up with differential diagnosis. They both hark back to experience, for other things being equal, the man with the broadest experience ought to be the best diagnostician.

The roentgenographic appearance of gall stones will vary according to the amount of lime salts present. Thurston Holland quotes the late Dr. O. T. Williams as saying, "It is rare to find stones composed of pure cholesterin on the one hand, or of pure pigment salts on the other. The cholesterin stones almost invariably contain some pigments, such as calcium salt, and further, in those I have examined, there has usually been present some calcium carbonate. Nearly all gall stones contain a good deal of cholesterin, and calcium salts of the bile pigments may be said to be invariably present."

The more lime salts present in a calculus, then the more readily it shows up on the roentgenogram. Much has been said about the so-called ring-formed shadow as being characteristic of gall stones. When this peripheral shadow is due to calcium carbonate it usually stands out in relief, the central area varying in density according to the amount of calcium salts present. This is the type of gall stone that is easy to recognize. When the peripheral shadow is due to inspissated bile or bile pigments in which cluster a group of cholesterin stones poor in calcium content, then one must examine the plates minutely for them (See Fig. 2.) This is the type of stone that escaped roentgenologists until

FIG. 2.

Arrows point to two gall-stones, the type not easily reproduced. The patient had been operated upon twice within nine years for gall-stones and none found. Following my roentgen diagnosis patient was operated upon by Dr. C. J. Dacey and two stones were found.

George demonstrated them at Cleveland and Cole checked up his work.

This is the type of stone that cannot be reproduced photographically with anything like success and is the type of stone that consultants question because they cannot detect it on the plate.

Dr. E. A. Codman, a Boston surgeon, in his second hospital report, blames three errors in diagnosis to lack of faith in the x-ray. One case in point was a patient operated upon for gall stones after Dr. Arial George had made a definite negative diagnosis. No gall stones were found at operation.

On the other hand, any and every shadow does not mean gall stones. Food remnants, bismuth remains from treatment or residue from a meal, calcified costal cartilages, calcified mesenteric glands, and, chiefly, renal stones, must all be differentiated.

A renal calculus usually gives a homogeneous shadow and in shape often takes on the contour of the kidney pelvis. A simple method of differentiation between biliary and renal calculi is to make plates with the patient prone and supine. If the shadow is more distinct with the patient supine the shadow may be considered a kidney stone, and vice versa a gall stone if the shadow is more distinct with the patient prone. This method is simple but far from exact.

Figure 3 shows a shadow apparently within the gall bladder. This plate was made with the patient prone. The plate, made with the patient supine under exactly the same physical conditions, gave a much less distinct shadow. The patient had been referred for gastric symptoms, there being question of gall stones. With the previous method of differentiation and history one might jump at the diagnosis of gall stones. A lateral view may save the necessity of catheterization of the ureter. If one sees the shadow lying against the vertebrae, then one can be reasonably certain that one is dealing with a kidney

FIG. 3.

stone. The only absolute method of differentiation is by catheterization of the ureter, which was done in the case just referred to and the catheter and stone were seen in apposition. If catheterization were done in the case quoted by Panner above, there would have been no need to make the diagnosis at autopsy.

When no direct evidence of gall stones is found, a negative diagnosis should not be rendered until the indirect evidence of gall bladder disease has been looked for by serial plates and roentgenoscopy. This done, one may with safety make a positive or negative diagnosis of gall stones, and not before.

The errors in hospital diagnosis may be greater than in private work. This is to be expected for one cannot, unless gifted with the tongues of Babel, impress on the foreigner who comes for examination the necessity of holding the breath at the time that you order it done, and even slight movement will preclude many a positive diagnosis of gall stones.

No mention has been made here of my own cases for I cannot but feel that my results have been so far altogether too uniformly good. I do feel very strongly, however, that with our present knowledge, a positive or negative diagnosis of gall stones is dependable.

The proof of the pudding is in the eating. The ideal would be to have a surgeon or group of surgeons submit their cases that are to be operated upon, irrespective of what may be the roentgen findings. In this way we should soon learn whether or not we have in the x-ray an infallible guide—infallible as anything wherein enters the personal equation can be—in gall stone diagnosis.

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BRIDGING A GAP IN OUT-PATIENT SERVICE.*

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THERE are three fundamental factors which enter into the care of all patients whether in private practice or in hospital service: First, the skill of the surgeon or physician; second, the equipment for diagnosis and treatment, and third, the personal relation of the doctor and patient:—a relationship which, when rightly comprehended, places the responsibility upon the physician of seeing that his patients understand the treatment required and how it may be obtained. The first two factors have for a long time been carefully considered but until recently the the third factor in institutional work has been neglected. In our private practice we are able to personally control our patients and to make them realize the necessity for carrying their treatment to completion. If this is not done we are sure to know it. On the other hand, in a large out-patient department, with its constantly changing corps of attending physicians and the large number of patients treated daily, how many of us know whether the operation we advised has been arranged for or whether the patients we saw last week have returned as many times as they should and will continue to have treatment until they are cured?

In addition to these three factors it is well to remember that a physician's or surgeon's reputation and the good name of the institution with which he is connected are at stake. This has been brought home to me quite forcibly during the past two years. For example, a man came to the Out-Patient Department of the Boston Dispensary with sutures still in his scalp which were surrounded by mild infection. My first impulse was to criticize the institution which sewed up his scalp, but, upon investigation, it was found that necessity of returning for the removal of the sutures had not been clearly explained to him. The second case was that of a young woman who fell and hit her elbow a few hours before coming to the Out-Patient Department. She was examined and a diagnosis of probable fracture of the olecranon was made. After temporary immobilization, she was told she should return the next day for an x-ray examination. Some two weeks later she was seen, and explained that as her arm did not pain her very much she had removed the dressing and resumed work without having an x-ray. Examination was immediately made proving that she did have the fracture suspected but that the loss of time had given her an elbow which then could not be straightened out and which would mean for her a long course of manipulation and baking. The third case, which represents another class, is a man who came under observation and received an immediate diagnosis of inguinal hernia. He was strongly advised to have an operation and, seeming perfectly willing to do so, was referred to a hospital. Some months later he was brought into one of the large general hospitals with a strangulated hernia.

Cases such as these have made us at the Dispensary feel the necessity of finding out whether these patients represented exceptions or whether they represented the ordinary incompleteness of out-patient treatment. A study this year made of the surgical department showed that 45% of the new patients made but one visit. A few of these cases, of course, did not need to come back, for one visit would give them the opinion they desired, but most of them should have had further treatment or be placed in a general hospital where they could have needed operations. With increased interest we began to study the results of a competent follow-up system in other departments of our own institution and found that it worked an amazing result on the efficiency of those clinics. The following chart shows almost dramatically the result of the follow-up work on the two gaps in out-patient treatment, namely: *insufficient visits* and *disregarded advice.*

"BEFORE AND AFTER TAKING."

A Follow-Up System.

In Relation to Visits.

MALE G. U. CLINIC.

Per Cent. of Gonorrheal Patients making more than 1 or 2 visits.

1911-12	(before)	37.6%
1914-15	(after)	76.5%

MEDICAL CLINIC.

Per Cent. of Patients making more than 1 or 2 visits.

1914	(before)	51 %
1915	(after)	94 %

In Relation to Advice.

EYE CLINIC.

Per Cent. of Patients who secured glasses advised

1911-12	(before)	50 %
1914-15	(after)	97 %

GYNECOLOGICAL CLINICS.

Per Cent. of patients who secured operation advised

1913	(before)	7% Secured it
1914	(after)	95% " "

Briefly, the follow-up system used at the Boston Dispensary may be described as follows: A card ruled in such a way as to give a space for each day of the month is attached to each history card as it is sent with the patient to the doctor. The doctor indicates on that card when he wishes to see the patient again and these cards are filed together under their respective dates. At the end of each morning, it is easy to see what patients who should have come back failed to do so, and they are then written to and advised to

* The substance of this paper was presented by me to some of the surgeons who visited the Boston Dispensary during the recent Clinical Congress of Surgeons. It presents from the viewpoint of a doctor, who runs his own clinic, some of the facts which have been used in previous papers from an executive's standpoint.

return. If they fail to return after receiving written word, their case is brought to the attention of the visiting physician or surgeon, and if he considers it of sufficient importance, a visitor is sent to the patient's home to explain the necessity of further treatment. To demonstrate the success of postal cards alone, 140 of them sent in one clinic brought a return of 128 patients. Of course, no such result could be expected unless the patients were sent for shortly after their first visit.

Some may question whether such a "paternalism" of a clinic may not tend to diminish its size. Fortunately, figures are available in answer to such inquiries. In one of our clinics the number of new patients increased over 200% as a result of the follow-up system. Patients receiving letters or visits seem to feel that real interest is being taken in them as individuals.

In contrast to the three cases just quoted, I wish to detail one more where the follow-up system demonstrated its efficiency. A woman within two weeks of confinement came to the Dispensary with a well marked cancer of the breast. Of course she could not be operated on until after delivery. In the natural course of events she would have been lost sight of, being merely advised to have an operation "as soon as possible." However, she was referred to a social worker who took the responsibility of seeing that the surgeon's advice was carried out and she succeeded in having her operated two weeks after the delivery of her child. This involved following the woman to one of the small towns outside of Boston and arranging for the care of her family during her absence from home, which probably would not have been possible without outside help. This patient was kept track of for two years after her operation, being seen at intervals at the Dispensary by the doctor who first made an examination and advised operation. With a properly installed follow-up system, such completion of work would not be the exception but the rule.

Clinical Department.

CONGENITAL ELEVATION OF THE SCAPULA. A NEW OPERATION? CUBITUS VARUS. REPORT OF A CASE.

By Frank E. Peckham, M.D., Providence, R.I.

[From the Orthopedic Clinic of St. Joseph's Hospital.]

CONGENITAL ELEVATION OF THE SCAPULA.

This deformity has been written about by numerous authors, and the published results are not very encouraging. In some of the reported cases, there is mentioned a definite bridge of bone or fibrous tissue which anchors the scapula to the spine. Different writers recommend the removal of this bridge, and also a division of any muscles which tend to elevate the scapula, *i.e.* levator anguli scapulae and the rhomboids. Other writers advise that when there is no anchoring bridge to be removed, it is better that no operation be performed. With such difficulties and such an outlook as above described, when a concrete case presented, the question to be answered was, Is it worth while to operate?

No bony or fibrous bridge could be made out by examination and none was found at operation. A careful study of the shape of the scapula and of the anatomy involved led me to think that a solution of the difficulty was possible. In these elevated scapulae, the upper edge seems to be curved forward, making a rounded appearance over the top of the shoulder. It seemed probable that the levator anguli scapulae, although it held up the scapula, might easily allow of some motion backward and downward, if a strong pull should be made in this direction. Then looking at the diagonal position of the rhomboid muscles, it seemed fair to suppose that, if the scapula could be moved toward the spine and downward, its inferior angle must be pulled towards the spinous processes, and, instead of projecting prominently outward, it would then be drawn closer to the chest wall and become less prominent.

The case in question was that of a girl six years, four months old. Operation was done in July, 1915. A vertical incision was made between the posterior border of the scapula and the spinous processes. The trapezius was divided at the base of the spine of the scapula, and a V-shaped wedge of muscle removed. (See Fig. 1. C.D.) A suture was then taken through all of the tissues, sending the needle close to the bone, at the inferior angle (illustrated on the opposite side by B. Fig. 1), and passing it, also close to the bone, through all tissues anywhere in the region of the tenth, eleventh, or twelfth spinous process as the fixed point. (A. Fig. 1.) Forty-day chromic gut was used, and as this suture was drawn taut, the inferior angle (B. Fig. 1) was drawn towards the fixed point A and the whole scapula was drawn downward and toward the spine. Then the edges of the V excision in the trapezius were approximated, bringing D down to C, and sutured with chromic gut, hoping that the trapezius thus shortened would continue to hold the scapula downward and in place after all sutures had been absorbed. (Both sides of the picture were used for illustration, but, of course, the whole operation was on one side only.)

How well this was accomplished may be seen in the photograph (Fig. 2), taken in November, 1915. The inferior angle is not so low as on the normal side, but it is quite some shorter than its mate by actual measurement, so that the angles ought not to be level, anyway. It will be observed that the contour of the shoulder and neck is very nearly normal and that the arm can be elevated, as shown in the photograph. Although I did not exhaust the literature I saw no mention of such an operation as above described.

FIG. 1. Showing the excision of the V-shaped wedge C D, and the direction in which the scapula is pulled from B towards A.

CUBITUS VARUS.

Cubitus varus, or the so-called gun stock deformity, follows a fracture of the lower end of the humerus when the short fragment has not been held in a true alignment with the long fragment. In such a fracture, it might be considered for the time being that the forearm extends, not

FIG. 3. Showing method of strapping hand to prevent rotation.

to the elbow joint, but to the point of fracture, because any movement of the arm is from this point as an entity. Since such fractures have been treated by holding in acute flexion, there is one movement of the arm which, if allowed to take place, may result in this deformity. The arm, by its own weight, tends to sag downward and inward and, quite naturally, the hand and

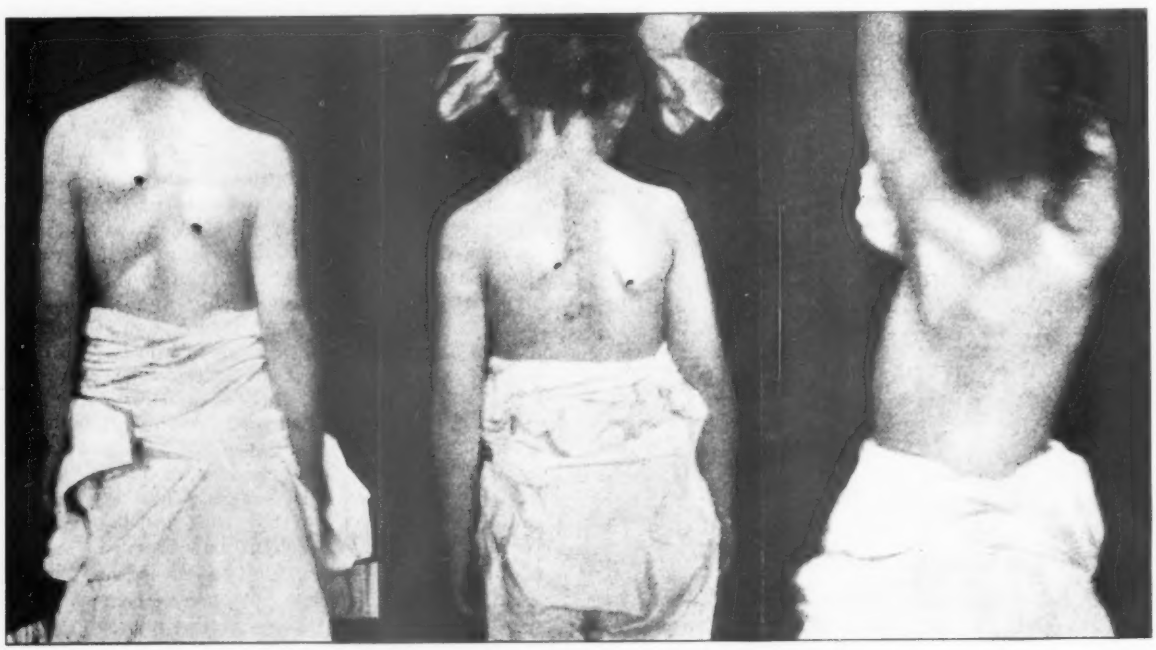

FIG. 2. Showing the contour of shoulder and neck before and after operation, as well as the ability to elevate the arm above the head.

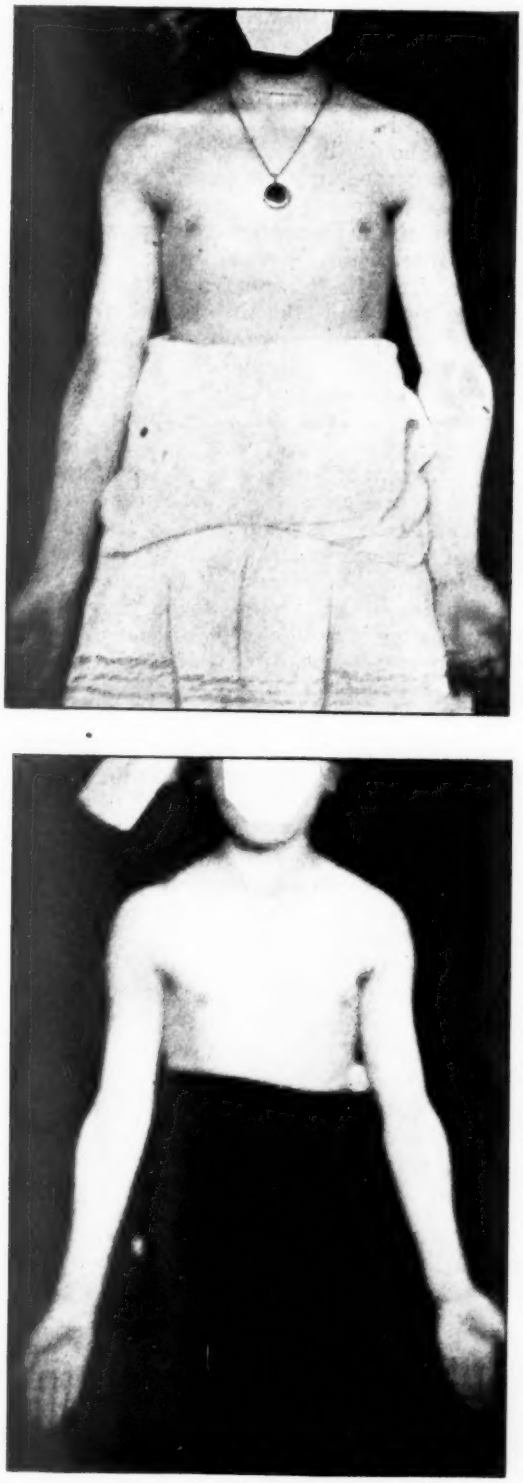

FIG. 4. Showing the arm before and after operation.

arm rotate inward and, as stated above, this rotation *takes place at the point of fracture*. This position may be corrected by passing a broad piece of adhesive around the hand, extending about four or five inches beyond, where another piece of adhesive, being reversed, is made to overlap the first piece and then passed along the back, thus holding the hand and arm, and preventing rotation. (Fig. 3.)

I wish to report a case of cubitus varus in a girl ten years of age. She fell from the cradle when a baby, striking the left elbow, and ever since has had a gun-stock deformity. For some time previous to her consulting me, the fingers had been tender and numb, and she would often drop things from her hand. There had also been pain and tenderness in the elbow, so that it had been considered suspicious of tuberculosis.

An osteotomy just above the external condyle was done April 14, 1913, and with the restoration of the proper carrying angle, the symptoms in elbow and hand completely disappeared. Fig. 4 shows the arm before and after the operation.

Therapeutic and Preventive Medicine.

OBSERVATIONS ON THE DIAGNOSIS AND TREATMENT OF DIABETES.*

BY MARTIN M. BROWN, M.D., F.A.C.S.,
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CONCERNING the diagnosis and treatment of this malady, I have nothing original to offer, but will present a few facts gleaned from various sources. All authorities are agreed that the condition of diabetes mellitus is increasing; that it is a disease largely, but not exclusively, of the well-to-do. The malady occurs at all ages and in both sexes. Heredity plays a large part, and is traceable in at least 20%. Observers are agreed that functional or organic disturbances of the pancreas are the main causative factors. Experimental observation upon dogs shows that complete extirpation of this organ is invariably followed by diabetes. The conclusion is drawn that the pancreas supplies an internal secretion essential to carbohydrate metabolism. Evidence has been accumulated which shows that other organs besides the pancreas exert an influence upon this process. Disturbances of the thyroid gland, parathyroid and suprarenal capsules are many times associated with glycosuria.

Normal sugar is present in the blood from 0.05% to 0.12%. In diabetes the amount varies from 0.16 to 1.16%. The kidneys are able to hold back sugar when it is present in normal quantity, but when the sugar concentration is increased, the kidneys are no longer able to hold the sugar back. Why does sugar accumulate in the blood? Two theories suggest themselves; one, that the diabetic cannot oxidize sugar; the other, that too much sugar is made. Normally, sugar is derived from carbohydrates, which make a very large amount of our food. That sugar may be formed from proteins has been demonstrated by many experiments.

Transient glycosuria, besides being caused by diabetic tendency, may be due to injuries, to feb-

*Read before the Berkshire District Medical Society, November 4, 1915, as part of a Symposium on Diabetes.

rile infectious diseases, to certain poisons, and to the excessive intake of sugar. In my own personal observation, I have met with several cases of transient glycosuria, due, undoubtedly, to the excessive use of sugar. In these instances, a proper regulation of diet in a short time rendered the patient sugar-free.

The symptoms associated with diabetes are familiar to you all. The diagnosis is established when repeated examinations of urine show the presence of sugar. Generally speaking, we become suspicious that a person may be suffering from glycosuria when he complains of excessive and frequent urination, unnatural thirst, pruritis, vague affections of the nervous system, and digestive disturbances which are not otherwise explained. The presence of boils and furuncles are always suggestive of diabetic conditions. It is a well established fact that all patients suffering from this disease have a marked lessened resistance, and the presence of sugar in the blood renders them especially prone to all kinds of infections.

The ideal treatment for any disease is the removal of the cause. In diabetes this is not possible, for the cause is unknown. The condition should not be treated in a routine manner; cases differ and must be treated individually. In no disease is the patient to be warned more against quackery and quack remedies, for the harm of improper treatment cannot be well retrieved. Diabetes is a disease against which the plan of battle cannot be laid for a month or a year, but for a decade, or possibly a lifetime.

Having determined that the patient has diabetes, after several urinary examinations, the next question to be considered is whether the case is mild, moderately mild, or severe. In mild cases, glycosuria disappears from the urine as soon as carbohydrates are eliminated from the diet. It is moderately severe when the sugar disappears upon restriction of the diet, but reappears when carbohydrates in minimum quantities are added. It is severe when sugar cannot be removed from the urine by eliminating all carbohydrates from the diet and restricting the intake of protein food. The essential point of the dietetic treatment consists in bearing in mind the impaired tolerance of the diabetic for carbohydrates by not overtaxing this tolerance. The power of assimilation for carbohydrates is not only conserved in the majority of cases, but increased.

Defective non-combustion or oxidation of carbohydrates, as well as of proteids, in diabetics brings about a condition known as acidosis, due to the presence of beta-oxybutyric acid, which accumulates in the blood, and together with its derivatives, acetone and diacetic acid, is eliminated in the urine. Acetone is also eliminated in the breath. When this condition is present, the patient is liable to develop diabetic coma. This coma is usually preceded by premonitory symptoms, such as restlessness, irritability, dizziness, pain in the limbs, headache and drowsiness.

The treatment of acidosis will depend largely on the previous history of the case. If the patient has been under competent observation, and has developed ketonuria on a strict diet, largely of proteids, he needs carbohydrates. Sodium carbonate should be given in large doses, frequently repeated until careful urinary tests show freedom from this condition. The treatment of diabetic coma must be prompt, energetic and intelligent. Free bleeding is oftentimes advisable, free elimination from the bowels with bitter salines, and the introduction into the blood, by every way possible, of alkalies.

The tendency of all diabetics to become infected with various maladies calls frequently for surgical intervention. No diabetic is considered a good surgical risk. In every case requiring surgical intervention, preliminary treatment, if possible, should be instigated. The urine should be made sugar-free, and the condition of acidosis eliminated; strictest aseptic precautions should be used. It is well to administer alkalies before an operation, whether diacetic acid is or is not present in the urine. The fear of operation upon diabetics has, in a great measure, subsided, and no up-to-date surgeon hesitates to resort to surgical methods of treatment in any diabetic case, when indicated.

My experience in the use of drugs or special remedies, with the exception of one preparation, is unsatisfactory. The continued and intelligent use of trypsogen in certain selected cases of a pancreatic type seems to have a beneficial influence. The small quantity of gold and arsenic act as a good tonic for the anemic condition, and the pancreatic ferments, theoretically at least, supply the needed defects, and materially aid in the digestion of carbohydrates.

CASE REPORTS.

CASE 1. Mrs. J. C., married, age 62 years. Under observation past 10 years. Passing large quantities of sugar in urine when first came under my observation. Diet restricted. Trypsogen administered. Gradual improvement. At no time has sugar been absent from urine, but greatly lessened. Has not taken tablets for about 5 years, but keeps in fairly good health by restricted diet.

CASE 2. Mrs. S. W., married, age 60 years. Under observation past five years. Passing continuously large quantities of sugar in urine. Restricted diet; use of trypsogen. Still using tablets, and finds that condition becomes much worse if omitted.

CASE 3. Mr. C., widower, about 50 years of age. Under observation 3 years. Sugar continuously present in large quantities. Unable to restrict diet to any degree. Takes trypsogen tablets faithfully. Urine sugar-free at end of two years. Discontinued tablets, sugar returned. Sugar-free when resumed tablets. General health first class, but gradual loss in weight.

CASE 4. Master L. S., 10 years of age. Under observation one year. Acute manifestation, no apparent cause. Attempted to restrict diet and

placed on trypsogen tablets. No improvement. Referred to Dr. Joslin of Boston. Placed in Deaconess Hospital and Allen treatment administered. Became sugar-free in about one week. Allowed to return home in six weeks. Remained sugar-free when instructions were carefully followed. Sugar present at repeated examinations during past three months, at times. Sugar present in small quantities at present time in spite of starvation treatment one day a week, and restricted 5% diet. Outlook unsatisfactory.

CASE 5. Mrs. R., age 58 years. Sugar present continuously in large quantities. Treatment—restricted diet, use of trypsogen tablets. Material improvement, but at no time sugar-free. General health at present time much improved over that of two years ago.

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THIRTEENTH RUSH SOCIETY LECTURE.*

(ABSTRACT)

Investigative and Scientific Phases of the Diabetic Question With Their Probable Relations to Practical Problems of Clinical Medicine, by Dr. Frederick M. Allen of the Rockefeller Institute for Medical Research.

Dr. Allen emphasized the necessity of keeping in mind the distinction between glycosuria and diabetes. The one was a symptom; the other a disease. One was glucose in the urine; the other a defect in metabolism. Defining diabetes, the author recognized the increasing agreement on the part of investigators that diabetes was deficiency of the internal secretion of the pancreas. This doctrine, it was said, went back to early observations of gross changes in a few cases of clinical diabetes, finally followed by Von Mering and Minkowski's production of acute diabetes by total pancreatectomy. Sandmeyer, by means of atrophy of a pancreatic remnant, produced a type of chronic diabetes comparable to the unusual human cases due to atrophy of the pancreas. A more accurate reproduction of human diabetes was afforded by removal of most of the pancreas, leaving the remnant with its normal blood supply and duct communication with the bowel. De Renzi and Reale first reported such an experiment in 1892. This form of diabetes was later rediscovered independently in four different places about the same time. The first in point of publication were Thiroloix and Jacob, who observed that when a sufficient portion of a dog's pancreas was removed, leaving the remainder in its normal connection with duct and blood vessels, this remnant retained its normal appearance and supplied enough pancreatic juice to maintain the animal's nutrition, yet diabetes developed and ran a gradual downward course much like the human disease. Their second important observation was that in suitably prepared animals this downward progress could be produced or hastened by over-feeding with carbohydrate. The second in point of publication was Helly, who studied only the glycogen, finding that in this form of diabetes the animals retain more or less glycogen, here resembling human diabetes. The third was the work of Allen, which dealt with various points concerning this type of diabetes, compared it with the normal and with other forms of diabetes and glycosuria, and also, thanks to the coöperation of Professor F. B. Mallory, described, for the first time, the specific changes in the islands of Langerhans in experimental diabetes. The fourth in point of publication was Homans, who discovered this form of diabetes in cats, and made the most accurate microscopic studies.

By this method, human diabetes, Dr. Allen stated, could be imitated in animals in the following particulars; (1) Mode of onset, sudden or gradual; (2) the influence of diet; (3) some individual idiosyncracies; (4) the diminished permeability of the kidney for sugar; (5) the effect of nervous influences; (6) the effect of traumatism; (7) a temporary stage during which there was glycosuria with little or no polyuria, thus resembling diabetes decipiens; (8) complications in the cachectic stages, generally not identical with the human complications, but rather an increased tendency to corresponding canine afflictions. There was no evidence that complications were due to increased blood-sugar.

The chief points of alleged difference between clinical and experimental diabetes, it was pointed out, had been the following: (1) The dextrose-nitrogen ratio, which is Lusk's figure of 3.65 in the severest human diabetes, whereas removal of the dog's entire pancreas gave only the Minkowski ratio of 2.8. Total pancreatectomy in the human subject, he said, should theoretically give a 3.65 ratio. It was well known, he observed, that phloridzin gave a 3.65 ratio in some species, and a 2.8 ratio in others; likewise the difference of species might explain the different ratios in diabetes. (2) The marked increase of metabolism in totally depancreatized dogs. To the author it seemed probable that partly depancreatized dogs with severe diabetes would not show such a great increase; it was now known that some severe human diabetics showed an increase of metabolism. (3) Anatomical changes in the diabetic pancreas. Weichselbaum had described so-called hydropic degeneration and other lesions in a series of 186 diabetic autopsies. Other investigators had not been convinced of the existence of any specific alterations in the diabetic pancreas. It was obvious that such advanced and generalized changes as were found in the pancreas in experimental diabetes were seldom, if ever, present in human cases, because they were too obvious to be missed. The classical work in the microscopic study of experimental diabetes was that of Homans. Using the Lane-Bensley technic, Homans proved that only the Beta cells showed the exhaustion and degeneration, while the Alpha cells remained intact. Homans had found some similar changes in at least a portion of the islands in human diabetes, and it would seem that the most promising prospect for the microscopic investigation lay in this direction. The functional element in human diabetes was also to be considered which, it was said, was emphasized by the results of treatment. The rapid clinical changes possible in human diabetes seemed to the author to indicate functional rather than organic alterations in the pancreas. Back of human diabetes might be, perhaps, a disorder of the abdominal nerves, possibly disturbing not only the function of the pancreas, but to some extent that of other organs. Though the kidneys were generally normal microscopially in diabetes, functional changes were frequent. Further study of the pancreas obtained quickly after death and fixed and stained by the best methods was regarded as important for deciding this question, and physicians who could obtain such material would render a service by sending for study. (4) A fourth difference was that found in ketonuria or acidosis. It was an old statement that the diabetic patient died in coma and the diabetic animal in cachexia; but by stopping the over-feeding of diabetic patients coma might be less frequent. Also, under suitable conditions, diabetic animals seemed to be subject to this intoxication. The present status of the theories of ketonuria or acidosis were discussed. The fact that severe diabetics were cleared up in these respects by fasting, whereas normal persons or milder diabetics developed ketonuria

* Delivered in Thomson Hall of the College of Physicians of Philadelphia, Jan. 21, 1916, at 8.30 P.M.

on fasting, along with various other experimental and clinical observations, threw the existing theories into considerable confusion. Ketonuria and acidosis seemed to the author to be not explainable by mere lack of carbohydrate, or even by habituation or individual idiosyncrasy. The fundamental nature of the process was in doubt. Diabetes, Dr. Allen stated, might probably be defined as a specific deficiency of the power of assimilating food. The accumulation of reserves, as when the body gained weight, diminished tolerance and aggravated diabetes, whereas the reducing of the reserve stores by low diet or by exercise increased tolerance and checked diabetes. Also one kind of food lowered the tolerance for another kind of food, as adding carbohydrate to a diabetic diet might give rise to ketonuria, and adding fat to a diabetic diet might give rise to glycosuria. The history of diabetic therapy consisted essentially in an interweaving or alternation of two principles: (1) The restriction of the sugar-yielding elements of the diet, namely carbohydrate and protein; (2) diminution of the total caloric value of the diet. The fasting treatment was in harmony with the observed benefits of these methods in the past. This had been previously outlined and details were to be published in monograph form. The principle underlying it was a well-established one in all therapeutics,—rest of a weakened function. No positive means of strengthening this function aside from rest has yet been discovered.

Medical Progress.

PROGRESS IN GYNECOLOGY.

BY STEPHEN RUSHMORE, M.D., BOSTON.

(*Concluded from page 282.*)

OPERATION FOR PROLAPSE OF THE UTERUS.

Mayo[23] discusses several forms of operation for prolapse of the uterus with associated pelvic relaxation. He advocates interposition of the uterus for cystocele with the first or second degrees of descensus of the uterus, but rejects it for the third and fourth degrees. For certain conditions after fifty, in which there is considerable protrusion after hysterectomy, a complete obliteration of the vagina has proved adequate and satisfactory.

If, with considerable prolapse, the bladder is not extensively torn from its uterine supports, with resulting cystocele, some modification of the Kocher operation is to be recommended. In these cases the chief object to be attained is to fix the uterus permanently. Sutures as ordinarily placed, tend to cut out in time and the uterus tends to come down. This has occurred in a sufficient number of cases to need special means for its prevention.

The operation of Mayo is based on Murphy's modification of Kocher's abdominal hysteropexy —splitting the uterus in the median line from the fundus to the internal os, and excising the endometrium. Each lateral flap of uterine wall is then turned outward from the median line and sutured between the rectus and its anterior sheath by chromic catgut and silk sutures. It is the placing of the uterine tissue beneath the fascia, which, according to Mayo, gives a better closure than the Murphy modification. The closure is in the usual manner.

In the cases where there is considerable cystocele, the uterine supports being also much relaxed and the uterus itself small, better opportunity for plastic support of the pelvic structure is given if the uterus is removed. The recommended incision appears as an inverted V on the anterior vaginal wall, the apex near the external urethral meatus, and the arms of the V being extended laterally and posteriorly to encircle the cervix and meet in the median line posteriorly. After opening the peritoneal cavity and delivering the fundus anteriorly, the broad ligaments are clamped with heavy straight clamps from above downward, two on each side. The incisions laterally to remove the uterus vary in their position according to the relaxation of the tissues. If not much relaxation is present, they may be made so as to leave in a slice of the uterine wall on each side. If there is considerable relaxation, part of each broad ligament may be removed with the uterus. Suturing, with continuous mattress of chromic catgut, begins posteriorly at the tips of the second clamps, which are rolled out so as to approximate the peritoneal surfaces and give no raw area in the peritoneal cavity. The suture passes back and forth behind the forceps, completely through the ligaments, tightening them. When the round ligament is reached, it is caught into the angle of dissection, where the bladder wall has been separated from the anterior wall of the vagina. "The suturing extends backwards on each side from this point, catching into the broad ligaments and then on each side into the angle of the depth of the dissection, thus compelling the bladder to rest on the broad ligaments." This is the essential step in the cure of cystocele. The rest of the closure is by running suture, the mucous membrane being approximated by submucous catgut. Perineal restoration completes the operation.

INVERSION OF THE UTERUS.

Roberts[24] presents an interesting and somewhat comprehensive account of inversion of the uterus, including historical notes, and a description of two cases seen by himself. Of these cases, one was relieved by taxis, a procedure recommended by Hippocrates; and the second cured by operation, the treatment recommended by Themison and Soranus. He gives references to the exhaustive studies of Crosse, Thorn and others, and has contributed a very readable paper.

Buck[25] reports two cases of inversion of the uterus on which he operated and notes briefly the technic employed. The anterior wall of the uterus was split from vagina to fundus. This free incision does not materially increase the loss of blood and facilitates eversion. He did

not find it necessary to resect the uterine wall to give accurate approximation, nor did he employ the transverse incision recommended by Kehrer. The transverse incision gives an additional resource in a difficult case.

Inversion of the uterus is becoming more infrequent through improvement in the obstetric art, yet occasionally the uterus will invert after childbirth without any manipulative interference on the part of the attendant. Buck's cases are interesting because subsequent to operation, one gave birth to four children and the other to two.

AMENORRHEA.

Kosminski[26] has briefly reviewed the literature regarding experimental work on the relations of the hypophysis to the genital glands. He also makes a clinical report on twenty cases of amenorrhea which he has treated by hypodermic injections of pituitrin or hypophysin. He has seen no bad effects, and a sufficient number of cases have been cured or improved to make the treatment worth trying, though, as he says, not all cases of amenorrhea without obvious cause are due to defective secretion of the hypophysis. In the present state of our ignorance, the injection should be tried, as it seems to do no harm and may do some good.

In the therapy of amenorrhea without obvious cause, that is, without mechanical obstruction, chlorosis, profound anemia or other constitutional disease, the so-called idiopathic amenorrhea, which perhaps rests on a functional disturbance of the uterus or of the ovary, or of both, Rieck[27] has found the intrauterine plug most useful. The particular form of instrument which he uses as being the most satisfactory he found on the market, invented and put on sale "for preventing conception." It can be easily introduced, and in his series of nineteen cases, over a number of years, has given excellent results. Most of these patients had been subjected to other forms of treatment without avail. The plug is left in for several months, and is retained in place by the constriction of the internal os, which contracts below a small knob at the upper end of the plug. The prejudice against the plug Rieck attributes to the defective mechanical construction of the old forms.

In some cases the plug happened to stay in for several years; in one eight years, then it was spontaneously expelled at miscarriage. Rarely do they give symptoms, but in one case it had to be removed. In a few cases there was complete failure, but in these the plug was apparently left in too short a time. In one patient the plug was romoved after seven months of amenorrhea, which has remained permanent. The indications for the use of the plug are amenorrhea or "oligorrhea" of months or years' duration.

INTRAUTERINE STEM DANGERS.

The use of the intrauterine stem pessary for the treatment of dysmenorrhea and sterility is increasing of late, according to Nicholson.[28] Soon after the introduction of this device it encountered considerable opposition, which has recently diminished. Some operators regard it as perfectly safe, others as requiring great care in its employment, while others still regard it as "unsurgical" and to be avoided unconditionally. Nicholson, whose advocacy of the stem pessary dates back only a few years, reports a case of severe pelvic infection ensuing three weeks after the introduction of a plug in a patient in whom no other source of infection could be found. Ultimately an abdominal operation had to be undertaken with removal of one tube and ovary and resection of the other. While the infection could not be proved to be due to the plug, the absence of any previous symptoms on the part of the patient and entire freedom of infection of the husband, as shown by two examinations, makes this explanation seem the most probable to Nicholson. This case calls attention to something with which every operator is familiar, that even a slight and seemingly safe operation may be followed by unexpected and serious results.

ATROPIN AND DYSMENORRHEA.

Novak,[29] following the suggestion of Drenkhahn, exhibited atropin in cases of spasmodic dysmenorrhea in young women with gratifying results. In such cases he makes no pelvic examination (generally there is nothing to be made out), but begins the administration of the drug two days before menstruation is expected to appear and continuing for two or three days, according to the usual duration of the pain, one one-hundredth of a grain three times a day. If pain appears, the dose is increased unless signs of atropin saturation are present. The dryness of the throat and the itching of the skin are usually easily tolerated. In some cases he has employed other drugs also, as aspirin.

Another drug which gives relief to some cases of dysmenorrhea is citric acid. Given in the form of sodium citrate three times a day, it is claimed to reduce the viscosity of the blood, and thus alleviate the pain of expulsion. Spitzig[30] has found that the nausea, dizziness, headache and mental irritability are vastly improved, and that clots and membranes (sic) are reduced.

MENORRHAGIA.

Jacoby[31] uses pituitrin to stop uterine bleeding, employing extract of the hypophysis in doses of one cubic centimeter every two days. The results were uniformly successful in fifteen cases. Occasionally disagreeable symptoms appeared, as nausea, and cramps in the abdomen. The treatment was purely symptomatic, and among the conditions in which it was used were threatened abortion, retroversion, disease of the adnexa and parametritis.

In the treatment of the group of cases in which there is more or less profuse bleeding at the time of the menopause, without obvious

cause, Gerstenberg[32] has employed undiluted formalin, forty per cent. formaldehyde. The technic is simple: cotton is wound on a Playfair sound and dipped into the solution for ten minutes. Two sounds are used for fifty seconds each. Bimanual examination is made two days before the passage of the sounds. There is no preliminary sponging of the cervix or of the uterine cavity, though the vaginal vault, and the vaginal portion of the cervix may be carefully dried with a sponge. Following the application the excess of formalin is carefully removed from the vaginal vault, and a tampon is laid in the vagina for from three to twelve hours. Douches are given after two days. The patient should be kept as quiet as possible, with cold applications over the lower abdomen. The application will cause uterine contractions, before which the sound must be withdrawn. The second sound is introduced when the patient says the "drawing" feeling has passed off. If two applications do not check the bleeding, Gerstenberg believes that some cause is present which demands other treatment, some form of operation. He has seen no bad results, and many beneficial, and thinks it an excellent substitute for the expensive x-rays.

CHEMISTRY AND PHARMACOLOGY OF THE UTERUS.

Ascheim[33] criticizes the views of those who regard the uterus as having an internal secretion, not on theoretical grounds, but because there is no evidence, he thinks, to support such a view. The analogy between decidua and corpus luteum fails morphologically and histologically. Experimental injection of decidual tissue is inconclusive because there is no way of telling just what is in the injected material,—it may be organic extracts or decomposition products of albuminous substances as far as we can tell.

But in regard to the external secretion of the uterus, Ascheim has confirmed the finding of a lipoid substance in the glands, and glandular epithelium in the premenstrual and menstrual stages, and in the early months of pregnancy. In the postmenstruum and the interval, this is a rare finding. Thus the occurrence is similar to the finding of glycogen in the uterine glands and epithelium. But the stroma cells contain lipoid substance as well as glycogen, especially in the decidua of pregnancy. The significance of this finding is not clear as yet.

Ascheim[34] has also made a study of the glycogen content of the uterus. It is well known that glycogen abounds in the body. Discovered in the liver by Claude-Bernard, it appears constantly in striped muscle and surface epithelium. Its presence in glandular epithelium, adrenals, smooth muscle, pancreas and serous epithelium is not constant. Langhans noted its presence in the epithelium of the mucosa of the body of the uterus, in the decidua and in the cells of Langhans of the chorionic villi. These are normal findings. Driessen, who observed glycogen in "glandular endometritis," regarded it first as pathological, but later held it to be normal. But it is not a constant finding in the uterus, according to Ascheim, for in children it was not present (autopsy material only) nor in women past the menopause.

In women of sexual maturity, Ascheim found that in the postmenstruum there was no glycogen except in glands which retained the premenstrual type. In the early part of the interval phase, when no secretion occurs, no glycogen was found. Later, as secretion begins, glycogen appears in the glandular epithelium as well as in the enlarging stroma cells. In the premenstrual stage, glycogen is abundant and easily recognized, chiefly in the more superficial portion of the endometrium, especially the epithelium, while in small quantities glycogen is found deep in the stroma as well as in the muscle. During menstruation, the glycogen content varies with the character of the glands: it is present in the glands of the premenstrual type, but absent elsewhere. If a pregnancy ensues, the glycogen becomes much more abundant.

It may be concluded that the formation of glycogen in the uterine mucous membrane is physiological, and is in some way connected with the anatomical changes in that organ. Absent in the first half of the interval stage, it increases in the premenstruum, and especially if pregnancy ensues it is abundant. It may, therefore, be suggested that the endometrium acts as a glycogen depot for the benefit of the embryo. This is but an additional element in the preparation of the endometrium for pregnancy, which by many is now regarded as an explanation of the premenstruum.

It has been suggested that in the absence of the normal glycogen content of the endometrium is to be found the cause of certain cases of sterility. As yet this has not been satisfactorily tested.

Lieb[35] has investigated the contraction of uterine muscle, using isolated strips of tissue cut from the outer and from the inner layer of the uterine wall, and comparing it with muscle of the wall of the tube. If such a strip of muscle, cut parallel with the direction of the fibers, is suspended in isotonic oxygenated Ringer's solution and its movements graphically recorded, two types of change may be noticed, corresponding to irregular variations in tonus and to rhythmic contractions, from ten to sixty per hour. The contractions of the non-pregnant uterus are slow but powerful, sometimes lasting for a considerable period, sometimes followed promptly by relaxation. In the tube, the muscle contracts much more frequently,—one hundred to two hundred per hour. The waves are small and may be quite regular in height and duration; in pregnancy the tubal contractions are slower and much stronger.

To what these movements are due is not quite clear, but since they appear in isolated tissue they cannot be due entirely to impulses arising

in the central nervous system nor in the nerve plexuses in the pelvis. That they are not completely independent of the central nervous system is indicated by the clinical fact that a psychic shock may lead to the onset of labor. Originating, then, in the organ itself, they may be due to an inherent rhythmic function of the muscle cells, or to impulses arising in the nerve cells of the tube and uterus. The absence of a well defined plexus, as that of Auerbach in the intestine, suggests the former source. It is possible that the contraction wave, starting in the tube, sweeps over the uterus in a manner similar to the cardiac contraction.

Having established this much, then, of the physiology of uterine muscle, the way is open for drug experimentation. It is found that epinephrin causes marked contraction of the parturient muscle, a point abundantly attested by the work of other investigators. But as epinephrin apparently produces sympathetic stimulation, it was not clear whether this sympathetic stimulation would be motor or inhibitory, as the effect varies in cats, for instance, with the functional condition. In these animals the non-pregnant organ is inhibited by epinephrin, the pregnant uterus is thrown into increased muscular activity. In the human, both in the non-pregnant and the parturient condition, epinephrin causes active contractions. Clinically, its use would be limited to checking post-partum hemorrhages either by douches or injecting into the uterus itself.

Ergotoxin markedly increases the muscle tonus, tending to give a tetanus, but in relative quantities which would be unsafe clinically. Other constituents of ergot were tested, as well as the fluid extract itself.

The experiments with pituitrin bear out in part the facts established by clinical observation. In the pregnant uterus there is increase of tonus and increase in the rate of contraction, but not much increase in force. Tetanus occurs only with very large doses. If the muscle is from a non-pregnant uterus, there is no effect, or there is a diminution of contraction, that is, a depression occurs. The explanation of this is not yet forthcoming. The analogy of the effect of epinephrin on the uterine muscle in cats at once suggests itself, but epinephrin has the same stimulating effects on pregnant and non-pregnant human muscle. It has been suggested that the uterus is sensitized during labor, but of this nothing is actually known.

BLOOD EXAMINATION.

Opinion is still divided as to the best treatment of the puerperal uterus containing retained products of conception. The finger, if it can be introduced into the uterus, has been pretty generally preferred to the curet, as it seems likely to do less harm, and if infection is present less likely to cause a spread of the infection by opening up new channels of entrance for the bacteria. Theodor,[36] basing his conclusions on bacteriological examination of the circulating blood after emptying the uterus for continued bleeding, regards the finger as more dangerous than the curet. He found bacteriemia in about fifteen per cent. of the cases after curettage and in seventy-seven per cent. of the cases after the finger was employed. According to his view, the finger presses the bacteria into the tissues and the blood stream. Confirmation of these findings is awaited with interest.

The changes in the circulating blood that take place during menstruation have been studied by a number of observers, but it cannot be said that their conclusions agree. Some of the periods of observation were obviously too short, and in other cases incompleteness from various causes vitiates the conclusions. Gumprich[37] studied five normal individuals for a period of five or six months, making observations with sufficient frequency to give the desired accuracy,—from two to four observations during menstruation and from five to seven during the intermenstruum. The hemoglobin percentage and the number of red and white corpuscles, as well as differential counts of the leucocytes were noted. The external surroundings were uniform so far as they could be controlled. The careful technic is fully described.

It was found that the hemoglobin showed only slight variations, about five per cent., and that no relation to menstruation could be made out. The erythrocytes showed variations of several hundred thousand, rarely a million, but these variations followed no rule, and during menstruation in one individual there was sometimes a rise and sometimes a fall. Gumprich, therefore, rejects Poelzl's theory of a typical premenstrual rise. The variation of leucocytes also follows no rule; sometimes a rise and sometimes a fall during menstruation was observed. The variations in differential count, while they are present, show no regularity in recurrence and no relation to menstruation.

Gumprich believes, then, that though even marked variations in the blood picture are found in normal healthy women, and may occur during menstruation, no definite relation to menstruation can be shown. The article is illustrated by a number of plotted graphs.

GANGRENOUS PERFORATION OF THE UTERUS.

It has been noticed among fatal cases of septic abortion that gangrenous perforation of the fundus sometimes occurs. Attention has been called to the peculiar shape of the gangrenous area, an inverted wedge like a keystone, suggestive of an infarct. As the possibility of an infarct in the uterus with its remakable anastomoses seemed improbable, a careful study of the uterine circulation was undertaken by Leclerq and Crépin,[38] using minute dissections, injections and radiographs. They found that in

a considerable area of the fundus of the uterus, the arterioles are terminal or nearly so, the anastomoses being very fine if present at all, in marked contrast with the blood supply of the rest of the uterine corpus. Thus they establish the anatomical basis for an infarct, which might arise following a septic abortion. The matter is of medico-legal importance, for such gangrenous perforation cannot now be considered evidence of instrumental interference with pregnancy.

STERILITY.

To meet the well recognized inadequacy of instrumental dilatation of the cervix as a method of giving permanent relief to stenosis, Schumann[30] has devised a plastic operation on the cervix. The cervix is dilated to about one and one-half inches with a Goodell dilator, and a strip of mucous membrane is removed from the posterior wall of the canal up to the internal os. A flap of vaginal mucous membrane is lifted from the posterior vaginal vault, the denuded area of the vagina closed, and the flap then sutured to the raw area of the posterior wall of the canal with fine catgut. After the graft has taken, it is cut free at its base of attachment. The procedure is said to be surgically simple of performance, but no results are reported.

X-RAY IN DIAGNOSIS.

The use of collargol solutions in connection with the x-ray as a means of diagnosis in diseases of the uterus and tubes, suggested itself to Rubin,[40] in view of the employment of these adjuncts in the diagnosis of the disease of other hollow organs.

It has here certain greater dangers, theoretically, as septic material may be carried from infected tubes to the peritoneal cavity, or, in aseptic cases, irritating material, which will give rise to aseptic peritonitis. That fluid introduced into the uterus will sometimes pass through the tubes into the peritoneal cavity, is clear from certain cases in which this passage has been observed. But the frequency of this occurrence is by no means definitely established

From his experiments Rubin concludes that five cubic centimeters of a five per cent. solution of collargol is necessary, which under pressure of about three millimeters of mercury, can be injected without pain, and represents a safe and adequate amount. Irritation rarely follows. The method is of aid: (*a*) in diagnosis of the patency or occlusion of the tubes; (*b*) in differentiating intra- from extra-uterine tumors; (*c*) in certain malformations and displacements; (*d*) in determining whether a single or a double salpingectomy had been done at a previous operation. The number of cases reported is small, but some such method as the one suggested would seem to have a considerable field of usefulness.

DIATHERMIA.

Heat as a therapeutic agent in gynecological diseases, has been employed for a long time, and the methods of application are extremely numerous: hot sitz baths, compresses, douches, hot air, the thermophore, and Flateau's pelvitherm may be mentioned. Recently diathermia has been applied,—the application of heat by means of high frequency, alternating electric currents. This differs from the other methods in that the heat does not penetrate from the outside, but is generated in the interior.

Sellheim was the first to employ it, but only for experimental purposes. Bruehl made the first therapeutic use and claimed relief of pains in old inflammatory conditions in the pelvis could be obtained more satisfactorily than by any other method of local treatment. Interested through the reports of these investigators, Kowarschik and Keitler[41] have used diathermia for about one and one-half years to test its therapeutic value. Although the method contains the possibility of inflicting harm, no burn has been seen in several thousand treatments by Kowarschik, indicating safety if properly used; for, as the authors say, burns may come from the ordinary thermophore. The application may be by means of two external electrodes, one over the lower abdomen and the other under the sacrum; or an internal electrode in the vagina and an external electrode like a girdle.

The indications are every form of disease in which heat is indicated, for heat is a most excellent method of producing hyperemia. It increases absorption, relieves pain, and has been applied with success in one case of dysmenorrhea.

The contraindications are, all recent infections, especially if there is febrile or subfebrile temperature. The presence of pus is a strict contraindication. Bleeding is another contraindication, for it is always increased by the heat, as would be expected.

The effect is much the same as the hot air treatment, but is more quickly obtained. The effect on the general circulation and the heart is less than that of the hot air. Fifty cases have been treated with results so favorable that the authors feel sure that diathermia has a distinct place among our therapeutic resources.

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Reports of Societies.

BERKSHIRE DISTRICT MEDICAL SOCIETY.

A meeting of the Berkshire District Medical Society was held on November 4, 1915. The program consisted of a symposium on Diabetes. The following papers were read:

"The Allen Treatment of Diabetes," Dr. J. B. Thomas.

"Observations on Diagnosis and Treatment," Dr. M. M. Brown.*

"Urinary Tests for Sugar," Dr. Thomas Flournoy.

Dr. O. L. Bartlett presented the following case:

CORRECTION OF CICATRICIAL ECTROPION AFTER A SEVERE BURN.

Miss C., an epileptic, had fallen on a hot stove and burned off half her left ear, the side of the face and cheek nearly to the mouth, the eyelids and eyeball.

When brought to the House of Mercy a month after the accident, the stump of ear had healed, the face nearly so, and the upper lid was completely everted, the margin attached to the brow by a dense cicatrix and the conjunctiva badly ecchymosed, showing only a small part of the cornea with a large sloughing ulcer. After the ulcer had healed, the eyelid was dissected from the brow, under ether anesthesia, stitched to the lower lid after freshening the edges, and then brought down as far as possible and attached to the cheek to allow for the contraction of the graft. A Wolff's flap was then dissected from the arm in the usual way, in area one-half larger than the surface of the lid to be covered, without any subcutaneous tissue, and stitched into place.

In four days, the dressings were removed and healing had begun. Though the surface for the most part looked dark and likely to slough, the flap soon took on a healthy appearance and healed nicely without even a stitch abscess. The stitches were removed from the cheek in a few days, but the effects of the tarsorrhaphy (ankyloblepharon) will remain for several months.

The lady has a blind eye, but her appearance will be remarkably improved.

See JOURNAL, page 317.

Harvard Medical School.

HEADACHE.*

DR. HARVEY CUSHING: There is no one symptom more likely to bring a patient to consult a doctor than an "ache," and we associate aches with the back, the belly, and the head. The subject of aches in any one of these three situations would be deserving of a place in this series of exercises which are supposed to be exercises of preparedness for the problems you are most likely to encounter early and often in medical practice.

Of all aches, those referred to the cranial chamber are perhaps the most common. Headache is admittedly a symptom of disease, not a disease in itself, just as cough, for example, is a symptom, and yet certain states in which headache is the paramount feature and of which the underlying cause is uncertain or unknown, are spoken of as essential headache or cephalalgia or hemicrania, just as we are compelled to call certain cases of epilepsy or hydrocephalus of obscure origin, essential or idiopathic epilepsy or hydrocephalus.

Hence, in our hospital records, headache or cephalalgia or, if the symptoms are unilateral, hemicrania, may appear as the diagnosis, though such a primary diagnosis is becoming more and more rare as our clinical acumen increases. A glance through the periodical indices under the topic "headache" will show how varied are the conditions under which this symptom is discussed, and serve as an indication of some of the causes of headache which must be considered when a patient presents himself with this as his major complaint. Thus we find *headaches* indexed as cardiac, sick, syphilitic, neurotic, nodular, idiopathic, rheumatic, strabismic, constitutional, indurative, refractive, reflex, neurasthenic; headaches due to gastric disturbances, to intestinal intoxication, to epilepsy, to constipation, to sinus disease, to renal disease, to carbon monoxide and other forms of poisoning, to pregnancy and pelvic disorders, to hypertension, to infectious diseases, and so on, almost without end. These, I may recall, are merely the titles of articles under which the symptom "headache" thus qualified is the subject of discussion.

Imperfect as such a subdivision may be, we, nevertheless, may conveniently divide headache into three groups: The first includes the *simple* cephalalgias of a relatively mild type, with which we are all unhappily more or less familiar; the second comprises the *essential* or *idiopathic* headaches, those in which the cause is not apparent, and under this group occurs the large and important division comprised under the designation "migraine"; and the third, the *symptomatic* headaches, which are definitely expressions of recognized disorders of one sort or another which produce intracranial discomforts.

Though I would not wish you to apprehend that every patient you will see with an obscure headache is going to give you in practice as great difficulty as is given by those who, owing to an unrelieved complaint, finally drift into hospitals, nevertheless, I shall illustrate our topic by bringing before you a few of the patients who happen to be in the surgical wards of the Brigham Hospital at the moment with the primary complaint of headaches.

* Abstract of lecture, delivered on January 28, 1916.

1. This man, a stationary fireman, 30 years old, complains of headache and backache, onset four years ago. He has been coughing and spitting up blood, which appears to come from the back of the throat. X-ray showed complete obscuration of right frontal sinus. At operation the right frontal sinus was found to be absent, thus accounting for the x-ray findings. On the left the membrane was of normal appearance. Spinal fluid negative. Wassermann negative.

The etiology of his headaches, therefore, not yet established, but is possibly due to sinus disease elsewhere in view of his expectoration. If his headaches were really due to pressure, which seems unlikely, we could thus account for his backache, for it is not uncommon to see the two aches combined when there is increased spinal fluid pressure.

2. The next patient is a woman of 43, who has had headaches during her early life which she calls "sick headaches." Fourteen years ago she was very much run down, had an inferior dental neuralgia, and following the division of the nerve, she was free from discomforts until three years ago.

Three years ago she began having severe suboccipital headaches which could be produced by exposure to cold. They were almost always relieved by massage and she has received osteopathic treatment. She has had many repeated attacks of "sore throat," and about three years ago, at the time of the onset of the headaches, some of her joints began to enlarge. Always during the period of headache, the muscles in the suboccipital region become hard and tender, and, as I have said, the discomforts are lessened by massage and hot applications. Cold cannot be endured.

This is probably a case of so-called "rheumatic" or "indurative" headaches, and in view of her enlarged tonsils and involved joints, a tonsillectomy should be contemplated.

3. Single man of 31 has had headaches of varying intensity for seven months. There have been one or two remissions after neosalvarsan administration. The headaches are present mostly through the day. There is some photophobia and "pain in the back of the eye." Eyesight has become poor, but glasses improved it. He is very drowsy. Physical examination shows choked discs; ++ Wassermann on blood and spinal fluid, 200 cells in spinal fluid. Decompression was done to relieve pressure.

This is a clear case of meningeal lues. The pain usually is more severe at night in these cases. A vigorous antiluetic treatment is indicated, but was badly tolerated before, owing to his pressure symptoms.

4. This married woman of 49 was brought here unconscious after a convulsion. Her complaint is of nocturnal headaches and backache for the past two months. They are of varying severity, start in the occiput and radiate especially to the frontal region, and are usually accompanied by tinnitus on the left side, once accompanied with vomiting. The headaches never come during the day. In the past two months she has had difficulty in "saying the right word" (motor aphasia), she has become irritable in disposition, and her memory has failed. The pupils are unequal. Her husband has locomotor ataxia, and we find her Wassermann on blood and spinal fluid ++. Cell count, spinal fluid, 14.

The diagnosis is cerebral syphilis and early dementia paralytica.

5. This young woman of 27, single, complains of headache of two years' duration, intermittent, worse at night, at onset (two years ago) in the back of the neck, now two to three times a week with feeling of dizziness, numbness in head, and as though "head would burst." There is a slight weakness on the left side. There is a history of instability (falling while at play as a child). The vision of right eye is much blurred, but eye grounds are normal and there is no actual failing vision. There is moderate muscular tremor, and a history of justifiable nervousness. She has seen many doctors and has always been given pills and been told that she was anaemic. Her blood shows Hgb. 84%; reds 5,400,000.

The etiology of her headaches is not clear, but she has worked for 13 years without intermission in a factory in poor surroundings and is much run down, and there may be no organic cause for her discomforts, though she was sent here with the diagnosis of cerebellar tumor.

6. Woman of 33, married, complains of headaches and failing vision for past 18 months. She has had headaches since 17, but two years ago they changed in type. They begin as pain in spine, which ascends through back of head to forehead, and are often confined to left side of head. They are sometimes accompanied by nausea and vomiting. There is history of a definite renal disease five years ago, for which she was in a local hospital; and also of a fall. Glasses have not changed headache. She has amenorrhea, is drowsy, and has a subnormal temperature, which would make one suspicious of pituitary disease; and we find a bilateral optic atrophy and homonomous hemianopsia. X-ray shows sella turcica almost destroyed.

The headache in these cases is probably due to stretching of the dural capsule of the gland as the structure enlarges. Pituitary headaches are very characteristic and the relief from surgical measure is often very striking.

7. Woman of 38, married, having always had headaches; says that four years ago they increased in severity and frequency, and were accompanied by nausea and vomiting, without relief, and by failing vision. They gave a peculiar feeling of tightness or filling up of the head. In the past four months she has had some remission of the headaches. She notes that her hands and feet have been large for five years, and that she has had a "thick feeling" in arms and hands for about the same time. There is some photophobia. Examination shows primary atrophy of optic disc, with temporal hemianopsia and unequal pupils. Wassermann and cell count negative. X-ray shows a large amount of destruction in the region of the sella.

This is the reverse condition from the previous case, so far as the hypophyseal symptoms are concerned, but in both there is an enlarged gland with pituitary headache.

8. Man of 45, single, complains of frontal headaches, increasing in severity of late and accompanied by some dizziness, but no nausea. Headaches of late have incapacitated him for work. Patient is markedly dystrophic sexually, feminine in voice and somewhat so in contour. X-ray shows normal sella.

In this case there may be dural nodules or hyperostoses as a cause for the headache. There is a thickening of the bones of the skull that recalls

the thickening of the frontal bone sometimes seen after pregnancy.

9. This woman of 63 has had left trigeminal neuralgia. After alcohol injections and various other forms of treatment, she had the ganglion resected 10 days ago. At operation, as is usual, cerebrospinal fluid was lost, and for the following day or two she had headache limited to the right side of the head, though it is to be noted that the operation was done on the left side.

This is a common observation and is significant in connection with the theory of headaches in general, for the brain itself is insensitive, but the dura is extremely sensitive, and inasmuch as the trigeminus supplies all of the membrane on one side, except just around the foramen magnum, after a ganglion operation the capacity of appreciating a headache on the side of the neurectomy seems to be lost. It is of further interest to note that the headaches of pregnancy come on at a time when the pituitary is enlarged, and in similar ways we may in many cases clearly attribute this symptom "headache" to dural stretching. The region of the foramen magnum is supplied by the vagus, and in gastric disorders pain is often referred to this region.

Changes in cerebrospinal fluid pressure may give headache, and another common causative factor is the cerebral edema which accompanies many states, such as poisoning by alcohol, ether, and some other drugs. Indeed, in some of these conditions there may be merely an increase in the outpouring of the fluid from the plexuses.

The theory of the production of headache, as you will see, is not at all clear, but distension or distortion of the sensitive pachymeninx from one cause or another is a possible explanation for many types.

ALAN GREGG, A.B.

MEDICAL MEETING IN THE AMPHITHEATRE OF THE PETER BENT BRIGHAM HOSPITAL.

TUESDAY EVENING, FEBRUARY 15, AT 8.15 O'CLOCK.

DR. HENRY A. CHRISTIAN, President, in the chair.

EXHIBITION OF CASES.

DR. CHASE: A patient with a fracture of the scaphoid bone of the wrist and a dislocation of the semilunar bone.

DR. F. DONAHUE: Industrial Insurance and its Relation to Fractures of the Carpal Bones.

PAPER OF DR. J. W. SEVER.

A RESEARCH ON OBSTETRICAL PARALYSIS, ITS CAUSATION AND ANATOMY.

About 300 cases of obstetrical paralysis have been observed in the Children's Hospital. This is a large number for one institution. The present report is based upon a study of about 150 selected cases.

The paralysis follows a difficult labor. Very often there is a vertex presentation and forceps are used. The mother is usually etherized. Accompanying such a delivery there is usually an asphyxia of the child.

As a rule, the deformity is noticed at once, or within twenty-four hours. The child appears to have a flail-arm. The whole arm usually is affected at first.

The upper type of paralysis results from an injury to the fifth and sixth divisions of the plexus. The sheath is commonly ruptured and this is followed by hemorrhage. In the severer forms, there is more injury to the plexus, amounting occasionally to a complete rupture of all the cords. Later scar tissue appears and in time this may press upon uninvolved nerves, leading to a still greater loss of function. In such severe cases there is found to be an injury to the homolateral half of the cord.

It is very rare to find tenderness above the clavicle even in the earliest cases. No injury to the shoulder joints has been noted in any of the early cases of real obstetrical paralysis. There are neither joint subluxations nor bony changes.

Later in the course of the affection, certain definite secondary changes make their appearance, such as the persistent inward rotation of the arm, the marked contracture of the pectoral and subscapular muscles, the secondary dislocation of the head of the radius, and so on.

In the past such deformities have been treated, purely from the neurological point of view, *i. e.*, with electricity, massage, passive motion, etc. Such conditions should be handled like any other orthopedic problem. It is essential to place the arm (in the early cases) in the correct position and to retain it so until the paralyzed muscles regain their function, or until the chances of bad contracture are lessened. At least 80 to 85% of the cases make a complete recovery, so far as paralysis is concerned. The contractures which appear secondarily in the untreated cases, of course, will require appropriate care.

The lower arm type (or, more correctly, the whole arm type) involves both the upper and lower segments of the cord. It usually comes with breech presentations when the arms are extended. The pull then comes more directly and more horizontally on the plexus. Only seven of the 140 cases showed a lower arm type.

A pupillary inequality accompanies most of the cases of the lower arm type. The homolateral pupil is smaller than the opposite one and reacts poorly to light. This is a sign indicating a severe nerve injury.

It seems fair to state that probably a certain percentage of these cases is due to poor obstetrics rather than to difficult labors.

PAPER OF DR. ALBERT EHRENFRIED.

HEREDITARY DEFORMING CHONDROPLASIA, "MULTIPLE EXOSTOSES"

This disease is usually considered to be a rare affection. Within the past year, I have been able to collect ten cases in Boston.

It appears to be a distinct clinical entity for the following reasons: First, it is a disease of the epiphyseal cartilage, a dysplasia of the cartilage; second, it is accompanied by very characteristic deformities of the bones; third, it is hereditary. Four or five males are affected to one female. While unaffected males never transmit the disease to their offspring, unaffected females may do so. It is only rarely met with in the native born Americans. Of the foreigners, the Germans apppear to be most

frequently affected, the French next, and the English the least. Cases, however, have been reported from all parts of the world.

Nearly one-half of the published cases of congenital subluxation of the proximal end of the radius really belong in this class.

Osteochondromata are of frequent occurrence in this disease. Fully five per cent. of the cases ultimately succumb to metastatic tumors of this nature.

(Lantern slides were shown to illustrate both papers.)

ERNEST G. GREY, M.D.

Book Reviews.

Pellagra. An American Problem. By GEORGE M. NILES, M.D. Second Edition, Illustrated. Philadelphia and London: W. B. Saunders. 1915.

The first edition of this first original work in English on pellagra was reviewed in the issue of the JOURNAL for May 30, 1912, (Vol. clxvi. p. 822). In this second edition, many changes and additions have been made. In particular the chapter on etiology contains the result of the recent investigations by Dr. Joseph Goldberger and by the Thompson-McFadden Pellagra Commission. The chapter on treatment contains a number of recent therapeutic suggestions, including the use of emetin and of scarlet red ointment. In his original work the author expressed his belief that pellagra is a disease belonging in the class of food intoxications. While the etiology of pellagra can hardly be considered as yet entirely settled, the tendency of investigation during the past four years has been in the direction of confirming this belief. The book should continue to maintain its position as an authoritative monograph on the American aspects of pellagra.

The Baby's First Two Years. By RICHARD M. SMITH, M.D., Assistant in Pediatrics, Harvard Medical School; Assistant Visiting Physician, Children's Medical Department, Massachusetts General Hospital, Boston. With Illustrations. Boston and New York: Houghton-Mifflin Company. The Riverside Press, Cambridge. 1915.

This little book for mothers is one of the best, if not the best, of its kind which we have seen. It is founded on the teachings of the Harvard Medical School, and is the first book for mothers which gives the Boston point of view as to the care and feeding of babies. Being written in part by a physician and in part by an experienced mother, both the scientific and practical sides of the subject are given due consideration. The advice given is sound and sane. Nothing which it is wise for a young mother to know is omitted. Where everything is so good, it is difficult to select special portions for commendation. We cannot, however, forbear from calling attention to Chapter XIII, "A Typical Day," written by Mrs. Greene. A mother who has mastered it can hardly go astray in the daily care of her baby. A unique feature of the book is, as is stated on the title page, that the author's proceeds from the sale of the book are to be devoted to the work of the Milk and Baby Hygiene Association of Boston. It is a pleasure to recommend this little book to all present and future mothers.

The Operations of Surgery. (Jacobson.) Sixth Edition. By R. P. ROWLANDS, M.S., Lond.; F.R.C.S., Eng., Surgeon to Guy's Hospital; Lecturer on Anatomy to the Medical School; and PHILIP TURNER, B.Sc., M.S., Lond.; F.R.C.S., Eng., Surgeon to Guy's Hospital; Teacher of Operative Surgery to the Medical School. With 797 illustrations (40 in color). Volume I: The Upper Extremitiy; The Head and Neck; The Thorax; The Lower Extremity; The Vertebral Column. Volume II: The Abdomen. New York: The MacMillan Company. 1915.

These two volumes of approximately 1000 pages apiece, represent a careful revision and a partial rewriting of the previous fifth edition, but Mr. Jacobson himself no longer appears as author. Mr. Rowlands and Mr. Turner, to whom the work of producing the sixth edition has been entrusted, are well known and well qualified for the task: having not only a thorough knowledge of surgery, but also an exact familiarity with anatomy to aid them in the production of the new edition. The work is larger than Treves' two volumes, and much larger than most other English text-books on operations. The authors say that they have tried to keep before them two main objects—"to do justice to the work of others, and to save our readers some of the difficulties and anxieties which have beset our paths." They have been successful. American authors and operators have been widely quoted, and with good judgment. The list of operations is complete, including those of gynecology, genito-urinary surgery, and the eye, ear, nose and throat. The book is distinctly conservative; the descriptions are clear and complete; the indications for operations are concisely considered; the illustrations well chosen and admirably reproduced; the type distinct and of good size. The book maintains the high standard of previous editions. It may be cordially recommended to surgeons and advanced students.

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PIGNET'S STANDARD AND CHINESE STUDENTS.

No thoroughly satisfactory system of comparative estimation of physical development has been found, but among the most serviceable standards for this purpose is the formula devised by Pignet, a French army surgeon, who, in the course of various anthropological studies on soldiers and recruits evolved an empirical standard of physical fitness. This standard has been widely used in European armies as a means of judging the physical condition of recruits and the effect of training. His formula is $F = H - (C + W)$, where F is the empirical factor, H the height in centimetres, C the chest girth in centimetres at maximum expiration, and W the weight in kilograms. The larger the factor the poorer is the physique. In rare cases F becomes negative, but this is only in case of men with exceptionally robust development.

According to the size of this factor, Pignet classified men as very strong where the factor was less than 10, strong between 10 and 15, good between 15 and 20, medium between 20 and 25, weak between 25 and 30, very weak between 30 and 35, and useless for the army over 35. This standard has been found applicable to Europeans, but that does not guarantee its accuracy for other races. It will, of course, give an exact comparison, but it by no means establishes a normal. It has been applied, for example to the Indian army, by R. H. Firth, who tabulated the measurements of 5676 Indian soldiers in an article submitted to the Royal Army Medical Corps Journal in October, 1912. The results were as follows: Factor less than 10, 2.9%; factor 10 to 15, 9.3%; factor 15 to 20, 16.2%; factor 20 to 25, 17.3%; factor 25 to 30 25.5%; factor 30 to 35, 16.4%; and over 35, 11.7%. Thus about 50% belonged to the weak classes, and yet the percentage of men showing the normal average for the Indian race may have been much higher.

It must be accepted, then, that any such standard of physical development can be considered a standard of normality only for the race from whose measurements it has been deduced. Beyond that race it gives merely a graphic comparison of measurements. With these considerations in view, it is interesting to compare the physical measurement of a group of Chinese students with such standards. In order to utilize figures in inches, feet and pounds, Pignet's formula has been modified by Captain J. A. Black, of the Royal Army Medical Corps, to the following:—$F=(W + C) - H$, where W is the weight in pounds, C the chest girth in inches at full inspiration, and H the height in inches. This scale corresponds to Pignet's formula as follows: over 120 very strong; 110 to 120, strong; 100 to 110, good; 90 to 100, fair; 80 to 90 weak; under 80 useless for the army.

In the annual report of the physical director of the college of Yale-in-China for the year ending March 30, 1915, figures are given applying this formula to the measurements of 181 students. Of these, 66% gave a factor below 80, 21% were between 80 and 90, 10% between 90 and 100, 3% between 100 and 110, .5% between 110 and 120, and .5% over 120. Thus only 14% of the 181 ranked above the weak and useless classes. Various things explain this marked deficiency in physical development, granting that

the standard can be applied justly to these students. Chief to be noted is the hereditary disinclination of the Chinese scholarly class for physical work of any sort. Even athletes have to overcome an age-old prejudice against exercise. Physical work is considered degrading and fit only for artisans, farmers and coolies. The scholar will have none of it. Hence the characteristic posture of the Chinese,—flat-footed on the heels, abdomen protruded, and chest sunken.

Continuing with the report, medical examination of the Yale-in-China students showed the following conditions: stooping posture, 37%; head forward, 78%; shoulders rounded, 49%; flat chested, 33%; costal angle narrow, 42%; pigeon breast, 6%; funnel breast, 6%; scoliosis, 8%; abdomen rounded, 9%; toes crowded, 20%; weak tarsal arches, 29%; good nutrition, 36%; fair nutrition, 47%; poor nutrition, 15%; general development good in 36%, fair in 40%, poor in 24%; minor abnormalities present in 14%; 5% suffered from trachoma, and in 35% the vision was less than 20/30; 8% had defective hearing. Polyps or narrowed nostrils were present in 8%, enlarged turbinates in 40%, diseased tonsils in 45%. In 34% the palpable vessel walls were thickened, murmurs were heard in 28%, and in 22% there was evidence of definite valvular disease. Three per cent. showed evidence of venereal disease.

The effect of athletics in improving the physical and mental condition of students can be measured here with considerable accuracy if careful examinations and measurements are made annually. It is to be hoped that this will be done, as it will throw light on the best line of development of school athletics in general, as well as indicate the response of Chinese students to physical culture.

COUNTY CARE OF TUBERCULATES IN MASSACHUSETTS.

ON February 19, the Massachusetts State Department of Health submitted to the general court a report on the present status of tuberculosis and provisions for its care in this Commonwealth. With this report is submitted also the draft of a proposed bill authorizing the commissioners of all counties, except Suffolk, Nantucket and Dukes, to provide adequate hospital care for all consumptives in cities and towns, the total population of which is less than 50,000, not having, but needing, hospital treatment. The provisions of this bill would become available on January 1, 1918, if the cost of the buildings did not exceed $10,000 each, and on September 1, 1918, if the cost were more than $10,000.

In its report the department maintains that the need and expediency of additional consumptive hospital provision is so clear as to admit of no debate. It believes that the smaller communities should not be called upon to finance alone the construction and maintenance of these hospitals, and therefore presents the county bill to meet these conditions.

Facilities in Massachusetts for hospital care of tuberculates are considered in the report to be now only two-thirds complete.

"Exclusive of beds for incipient pulmonary tuberculosis and for the non-pulmonary type, a total capacity for advanced consumptives of approximately 3600 to 4000 beds would solve the consumptive hospital problem. There are now 3165 tuberculosis beds, but of these 1068 are in the state sanatoria that are designed primarily for incipient cases. This would indicate that we have approximately one-half enough beds at present for complete hospitalization of advanced consumptives.

"Beds provided for consumptives by the larger municipalities through the generosity of private philanthropists, or charitable organizations, total 1176. Of the twelve cities, which come under the 50,000 classification, there are but three,—Cambridge, Lawrence, and New Bedford,—that are providing adequate hospital facilities for consumptives. Estimates of the number of additional beds needed by this group of cities as a whole is approximately 750.

"For the cities and towns having less than 50,000 inhabitants, there already exist for the entire group only 221 available beds. In other words, there is a deficiency of approximately 1400 beds for this group of communities, which is twice as great a deficiency as for the cities of 50,000 and more inhabitants.

"Aside from the bed provision made by the Commonwealth itself, and by the cities and towns, or by private organizations, there are in the state a certain number of beds which practically serve more than a local community: these are mostly private paying sanatoria. The total number of such beds, 165, is so small as not to be a factor of any consequence in the general problem."

In view of these conditions, the report concludes that:

"It becomes a paramount duty of the Commonwealth through appropriate action of the General Court to make such provision for the consumptive hospital needs of smaller communities throughout the Commonwealth as will adequately solve the local consumptive hospitalization needs of each and every community in the Commonwealth. County or district consumptive hospitals, so planned as to provide an efficient unit of administration without imposing the burden of excessive cost or of unreasonable difficulty of access upon citizens of every community served thereby, are the only practical type of institution that will meet the needs of the situation.

"Four possible solutions of the problem are given, namely, by the state assuming entire responsibility for tuberculosis hospitalization, by separate municipalities and towns, by leaving present conditions as they exist, and by evolving a new comprehensive and uniform standard of procedure to supplement gaps in existing hospital provisions. The department, in advocating the latter, says:

" 'This offers the opportunity of a new standard, both comprehensive and uniform, for the care and treatment of consumptives, by providing a logical solution of the problem. It furnishes a basis for continuity of effort in the plan of hospital provisions; thus, by this plan there will be furnished state hospital provision, county hospital provision, and municipal hospital provision; the county hospital provision to meet the needs of the smaller cities and towns, and to give them the same standards of service offered by the state and larger municipalities. In other words, a three-link chain of service, instead of two.

" 'The county unit appears to this department the only logical means for providing state-wide tuberculosis hospital facilities for consumptives for towns and cities of less than 50,000 population, not already provided for under the laws of the state. In these communities there is a distinct need of hospitals for consumptives which neither the state nor the municipalities have met thus far. Such a county plan should be based on a minimum bed provision of one bed to each death from tuberculosis, as outlined elsewhere in this report. With this general principle firmly established, it is the opinion of this department that the details of procedure should be properly left to the authorities who are charged with the responsibility of providing such hospital care, rather than to attempt to regulate by statute the individual needs of each community, and the accompanying legislation has been drafted with this object in view.' "

Further editorial discussion of this subject will appear in the JOURNAL when this bill comes definitely before the legislature for consideration.

AMERICAN FIRST AID CONFERENCE.

"A stitch in time saves nine," is a proverb applicable to more important events than the unravelling of a thread. The prompt use of first aid appliances in accidents occurring among miners, railroad men, factory employees, and soldiers has lessened infection and shortened the period of disability.

This was the conclusion arrived at by the First Aid Conference, held at Washington, in August, 1915, and reported in the *Military Surgeon* for January, 1916, and also in this JOURNAL. At this conference were representatives of the Medical Departments of the Army, Navy and Public Health Service, of the Red Cross, chief surgeons of a number of railroads of the United States, civil surgeons representing national surgical associations, general officials representing railroads, and representatives of manufacturers of first aid supplies. General opinion favored the distribution of some sort of simple first aid packet, and the Conference unanimously adopted a resolution leading to the appointment by President Wilson of a board of standardization.

This commission has been appointed. It will investigate first aid methods, packages, the standardization of first aid equipment, and a course of instruction to be followed throughout the country. The Commission will report to the American First Aid Conference upon all the preceding subjects, and has already sent out a questionnaire to many surgeons.

Aside from the undoubted value of intelligent first aid in case of accidents, it would seem that this movement, of national scope, must also be very useful in a preventive way. Most accidents are due to carelessness; by keeping before the public the results of negligence, individuals will think to exercise that grain of caution which may mean the difference between health, on the one hand, and on the other, permanent injury or death.

RABIES EPIDEMIC IN CALIFORNIA.

THE monthly bulletin of the California State Board of Health for December, 1915, and January, 1916, contains an interesting account of an epidemic of rabies among wild animals in the northeastern counties of the state. The epi-

demic has been brought under control by the State Board of Health with the coöperation of the U. S. Forestry Service and the Biologic Survey. Rabies became prevalent in domestic dogs in the summer of 1909 throughout the state, except in the northern section. Late in 1914 this section was invaded.

In 1910 rabies became epidemic in Southeastern Oregon, where it was spread largely by infected coyotes, and was brought under control by a vigorous campaign of the Oregon State Board of Health. Late in 1915 the disease became epidemic in coyotes in Lassen and Modoc counties in Northern California, and vigorous measures were at once instituted. The infected area was nearly 9000 square miles in extent, greater than Massachusetts or New Jersey. Rifles, traps and strychnine were the weapons used, with a system of thorough policing of the district and the offer of bounties.

Hundreds of horses, cows and other domestic animals and stock were bitten by rabid coyotes and large numbers died from rabies, the diagnosis being confirmed by histological methods. It is of interest to note the common symptoms of rabies in animals recommended to the public in the affected district. The chief ones are as follows: Sudden change of disposition, unusual nervousness or irritability, tendency to leave home, change in voice, refusal to eat, tendency to snap or bite without provocation, and weakness or paralysis of the legs or lower jaw.

Such an epidemic should be enough to convince even the most skeptical that there *is* such a disease as rabies, that there is a sure means of preventing it, and that proper quarantine and control of dogs will eliminate it.

MEDICAL NOTES.

BACTERIOLOGIC FINDINGS IN RECENT OUTBREAK OF GRIP IN NEW YORK.—As the result of the bacteriological study of fifty cases diagnosed as "grip" by physicians of New York, the Department of Health announced that the streptococus has played the leading rôle in the outbreak of grip and pneumonia which visited this city last month. This germ was found in large numbers in twenty-six of the fifty specimens examined; the diplococcus lanceolatus was present in nineteen cases, and the influenza bacillus in nine. The investigations were conducted at the Research Laboratory of the Department of Health, and were directed by Dr. Anna W. Williams, assistant director of the laboratory. Each specimen was examined both microscopically and by means of cultures. Many of the specimens showed large numbers of several different bacteria, and this accounts for the fact that the following summary yields a total greater than the number of specimens examined.

	Cases
Streptococcus	26
Diplococcus lanceolatus	19
Micrococcus catarrhalis	18
Bacillus influenzae	9
Staphylococcus pyogenes	9
Bacillus capsulatus	6
Bacillus bronchisepticus	2
Vincent's bacillus	1

It is interesting to learn that a somewhat similar investigation conducted some months ago showed influenza bacilli in only one specimen out of twenty examined. In the present instance this germ was present in nine out of fifty specimens, a proportion which indicates that this germ also played a part in the recent grip outbreak. The micrococcus catarrhalis resembles in shape and staining reactions the germ of cerebrospinal meningitis, but is otherwise not related to that organism.

PREVALENCE OF SMALLPOX.—A recent report of the United States Public Health Service shows that smallpox is now prevalent in Vermont, New Jersey, South Carolina, Idaho, Minnesota, Illinois, Montana, Ohio, Iowa, Michigan, Indiana, Nebraska, Pennsylvania, Louisiana, Oklahoma, and Oregon. In the weekly report of the Service for February 11, a new focus of the disease is reported in Maryland and three in Minnesota. There have also been a number of cases in Texas and West Virginia.

LECTURES BY DR. ROSENAU.—It is announced that the Harrington Lectures at the University of Buffalo Medical School will be delivered this year on May 30, 31 and June 1, by Dr. Milton J. Rosenau, Professor of Preventive Medicine and Hygiene in Harvard University. Two of the lectures will be on Anaphylaxis, and the third on Education for Public Health Service as a Career.

APPOINTMENT OF DR. STRONG.—It is announced that Dr. Richard P. Strong, Professor of Tropical Medicine in Harvard University, has been appointed vice-president of the American International Corporation. It will be his duty to supervise sanitation of the districts in which the company's development work is located.

MEMORIAL TO VON BEHRING.—It is announced that the Prussian Ministry of Public Instruction has ordered the erection of a bust of von-Behring in the Marburg Institute for Hygiene

in commemoration of the 25th anniversary of the publication of his work on serum therapy.

LONDON DEATH RATES IN DECEMBER, 1915.—Statistics recently published show that the total death rate of London in December, 1915, was 17.3 per thousand inhabitants living. Among the several districts and boroughs, the highest rate was 24.5, in Southwark, a populous district on the south bank of the Thames; and the lowest was 13.2, in Lewisham, a more remote southern suburb.

FEDERAL CONTROL OF TUBERCULOSIS.—On February 21 announcement was made in New York of a resolution recently adopted by the National Association for the Study and Prevention of Tuberculosis, urging participation of the federal government in the study and control of tuberculosis through the United States Public Health Service.

"The National Association proposes that by act of Congress a special division of tuberculosis be established in the United States Public Health Service with an adequate appropriation. This division should be manned by experts and should study the tuberculosis problem from every point of view and should, so far as possible, set up standards for the treatment and prevention of the disease throughout the country. One of the problems which it is proposed to study first would be that of the indigent migratory consumptive, particularly in the health resorts of various parts of the United States, such as California, New Mexico, Colorado and Texas. Another problem which it is proposed should be studied is that relating to the causes of tuberculosis. A bill introduced by Congressman Kent of California in the House and by Senator Norris of Nebraska in the Senate provides for some of the things which the national association asks for, and also for a federal subsidy to hospitals caring for non-resident consumptives.

"Commenting on the resolution, Dr. Charles J. Hatfield, executive secretary of the National Association for the Study and Prevention of Tuberculosis, says: 'In spite of the fact that tuberculosis is costing the United States from $500,000,000 to $1,000,000,000 every year in lives lost, the amount of money being spent annually by all private and public agencies is not much more than $2.000,000; and while a nation-wide crusade to stamp out tuberculosis has been organized, we are still ignorant of many of the factors that produce it. A few thousand dollars wisely spent in scientific research under federal supervision, will secure results of incalculable benefit to this country.'"

FEDERAL CONTROL OF TRACHOMA.—The recently published annual report of the Surgeon-General of the United States Public Health Service calls attention to its efforts in the control of trachoma by the establishment of small hospitals in localities where the disease is prevalent.

"The Service now has five trachoma hospitals in the three states of Kentucky, Virginia and West Virginia, and so great has been the number of applicants for treatment that a waiting list has been established. In the past fiscal year 12,000 cases of trachoma have been treated, the larger proportion of which were cured, while those in which a cure was not effected have been greatly improved and rendered harmless to their associates. The great majority of these trachoma patients were people who lived in remote sections far removed from medical assistance, and who, but for the hospital care and treatment provided, would have remained victims of the disease practically the remainder of their lives.

"When it is considered that thousands of persons suffering with trachoma, a dangerous contagious disease, would otherwise remain untreated, it is realized how far-reaching results have been obtained through these trachoma hospitals and the other public health work done in this connection. It would be impossible to estimate with any degree of accuracy the number of people who have been saved from contracting this communicable disease by thus removing these thousands of foci of infection.

"In addition to treating persons with the disease, the hospitals have been used for educational work. Doctors and nurses have visited the homes of the patients and have explained how to prevent the development and recurrence of the disease. One thousand three hundred and eight such visits were made during the year in Kentucky alone. It has taken some time to educate the people afflicted with this disease to the importance of cleanliness and the use of simple hygienic measures in their daily life. That results have been obtained is evidenced by the noticeably better observance of hygienic precautions by those among whom the work has been done.

"In addition to the hospital work, surveys were made in 16 counties in Kentucky, especially among school children. Eighteen thousand and sixteen people were examined, 7% being found to have trachoma. Similar inspections in certain localities of Arizona, Alabama, and Florida resulted in finding the disease present in from three to six children out of every hundred. Periodic examination of school children for the disease, and the exclusion of the afflicted from the public schools, are two of the recommendations upon which the Public Health Service lays emphasis.

"One of the special features of the trachoma work was the giving of lectures and clinics before medical societies in various counties where trachoma hospitals could not be established. Patients were operated upon in the presence of physicians and the most modern methods of treatment demonstrated. Throughout, the pur-

pose has been to stimulate local interest in taking up the campaign to eradicate trachoma."

EUROPEAN WAR NOTES.

ANTHROPOLOGY OF WAR PRISONERS.—It is announced that the Academy of Sciences at Vienna has granted a subsidy equivalent to $960 to Professor Pöch to continue his anthropologic measurements and photographing of the various ethnologic types among prisoners of war.

CASUALTIES OF GERMAN ARMY SURGEONS.—In the issue of the *Medizinische Klinik* for December 26, 1915, it is reported that to that date the names of 1084 German physicians were in the casualty lists. These names include 37 civilian physicians, 377 active medical officers, 373 medical officers of reserve, and 287 assistant medical officers. Of this total, 361 were killed, 142 severely wounded, 388 less seriously wounded, 102 taken prisoners, and 90 missing.

HOSPITAL UNIT FROM OTTAWA.—It is announced that a hospital unit is to be sent to the front from St. Francis Xavier College, Ottawa, Canada. The unit is to consist of 12 surgeons, 35 nurses, and 125 assistants and attendants. The unit will sail as soon as it has been accepted by the British War Office.

RED CROSS HOSPITALS IN AMERICA.—At a meeting in New York on February 17, a plan was initiated for the establishment of three Red Cross base hospitals in the United States, with a transportation unit and a hospital ship for the Atlantic coast. The sum of $24,000 has already been given to equip one of these hospitals for the care of 500 patients. The transportation unit, which will be supplied with motor ambulances and litters, is to consist of 20 physicians, 48 nurses and 90 aids. The accumulation of non-perishable surgical, medical and hospital supplies, to be stored for emergencies, is to be undertaken by the department of Military Relief of the National Red Cross and of each of the Red Cross chapters.

WAR RELIEF FUNDS.—On February 26, the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund	$99,631.60
Serbian Fund	81,312.47
Allied Fund	65,361.80
French Wounded Fund	47,851.05
Armenian Fund	34,500.61
French Orphanage Fund	28,793.32
Polish Fund	21,022.31
Surgical Dressings Fund	19,803.55
La Fayette Fund	18,584.53
Italian Fund	15,414.35

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending February 26, there were 277 deaths reported, with a rate of 18.99 per 1,000 population as compared with 261 and a rate of 18.18 for the corresponding week of last year. There were 5 deaths from influenza. Deaths from pneumonia numbered 32 against 40 last year.

There were 51 deaths under one year as compared with 35 last year, and 72 deaths over sixty years of age against 55 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 55; scarlet fever, 51; measles, 96; whooping cough, 42; typhoid fever, 3; tuberculosis, 39. Included in the above were the following cases of non-residents: Diphtheria, 8; scarlet fever, 15.

Total deaths from these diseases were: Diphtheria, 10; scarlet fever, 1; measles, 3; whooping cough, 1, and pulmonary tuberculosis, 25. Included in these were the following non-residents: Diphtheria, 3, and tuberculosis, 1.

HOSPITAL BEQUESTS.—The will of the late Lewis B. Carr, of Arlington, Mass., who died on February 11, has been filed for probate at the East Cambridge Court. Among many charitable bequests is one of $5000 to the Symmes Hospital, Arlington.

The will of the late Lucy A. Norcross, of Boston, who died on February 13, was filed for probate on Feb. 16, in the Suffolk Court. It contains a bequest of $25,000 to the Massachusetts General Hospital, contingent upon the death of the testatrix's daughter without issue.

INFANT MORTALITY IN WATERTOWN.—The recently published report of the Board of Health of Watertown, Mass., indicates an infant mortality rate in that city of only 45.7 per ten thousand, the average rate for the United States being 120. The general death rate of Watertown in 1915 was only 7.4, and for the preceding decade only 12.3. The birth rate was 27.5 in 1915, as against 24.1 in 1914. There was a great decrease in the incidence of typhoid fever, and a general decrease in all other infectious diseases, except tuberculosis.

EXPERIMENT IN OPEN AIR SCHOOLS.—The JOURNAL, in the issue of January 20, 1916, commented on the experiment carried on by the Winchester public schools in maintaining an open-air class in one of the school buildings. A further experiment has been tried with conducting a class in a room in which the windows are screened with cloth.

The open-air room of the Winchester school in 1914-15 was a complete success, but it brought two problems: how to continue the plan for the children themselves who have been in the ex-

periment, and how to extend it or secure approximate benefits for other scholars without large expenditure for special clothing. The plan of screening rooms is in the way of an attempt to find a satisfactory answer to these needs. It is not practicable to make all the rooms out-door rooms, but the benefits of fresh air should be secured for as many pupils as possible.

The plan followed at the Winchester schools is to place in each window a cloth screen equal in size to one sash. When the schools are in session the screen takes the place of the ordinary window sash, which is thrown open. The theory is that there will be constant passage of air through the cloth, and this will not cool the room any more rapidly than does the cold glass of the ordinary window. The room is, therefore, kept at the ordinary temperature, but the air will be fresh. The civics committee of the Fortnightly Club, which helped in the out-door room experiments, has equipped two rooms in one school, while the school committee has fitted out two others.

The results of the two methods have been computed in figures covering a year's time for the open-air room and for four months for the screened room, and they are interesting:

SEPTEMBER, 1914, TO JUNE, 1915.

	Height.	Weight.	Hemoglobin.
Regular	2.0 in.	4.8 lbs.	3.7%
Open air	1.5 in.	5.7 lbs.	8.2%

SEPTEMBER TO DECEMBER, 1915.

Regular	0.7 in.	4.4 lbs.	0.4%
Open air	0.9 in.	3.5 lbs.	5.7%
Screened	0.7 in.	3.4 lbs.	3.4%

Obituary.

ROBERT ALLEN BLOOD, M.D.

DR. BLOOD, who was surgeon-general of the Massachusetts Volunteer Militia from 1896 to 1904, died at Lake Sunapee, N. H., February 21, 1916, aged 77 years. He was born in New London, N. H., April 30, 1838; served in the army as private in the 11th New Hampshire Volunteers from August, 1862, to May, 1863, when he was mustered out because of wounds received in the battle of Fredericksburg. Settling in Charlestown after the War, he entered Harvard Medical School and was graduated with the class of 1870, and practised there from 1873 until 1904, when he moved to Brookline. He was a councilor of the Massachusetts Medical Society from the Middlesex South District in the years 1892-1897.

Entering the militia under Governor Greenhalge as medical director on the staff of Brigadier General Bridges with the rank of lieutenant colonel, in May, 1905, he was made surgeon-general a year later on the death of Surgeon-General Edward J. Forster, and held the office until March, 1904, when he resigned to resume practice.

Dr. Blood was at one time surgeon to the Soldiers' Home, Chelsea; he was a Mason and an Odd Fellow, and a charter member of the Charlestown Club, of which he was president; he was also president of the Association of Military Surgeons of the United States. He had made his home in George's Mills, N. H., since 1910.

A widow and one son survive him.

Miscellany.

MEMORIAL RESOLUTIONS.

THE BOSTON CITY HOSPITAL.

DAVID WILLIAMS CHEEVER, M.D.

The staff of the Boston City Hospital desires to place on record an expression of their great loss in the death of Dr. David W. Cheever. He was one of the original staff of the hospital. To his distinguished service, lasting many years, and to his desire and ability to grasp new ideas in the execution of his professional work, the hospital and the community owe a lasting debt. He was a true pioneer in surgical work.

The several generations of his associates and pupils will always remember his insistence that all his co-workers should maintain the same high standard of careful work which he exacted from himself; yet, with it all, he was a most considerate and courteous master. The staff offers its sincere sympathy to Mrs. Cheever and her children in their great loss.

GEORGE W. GAY,
HENRY JACKSON,
PAUL THORNDIKE,
Committee.

GEORGE HOWARD MALCOLM ROWE, M.D.

Dr. George Howard Malcolm Rowe was the Resident Superintendent and the Chief Executive of the Boston City Hospital for more than a quarter of a century. Those were years of great development at the hospital. Many old departments were enlarged and many new ones were inaugurated, and Dr. Rowe was not only the executor, but he was the inspiration of much of this work. He was recognized the country over as a man learned and wise in all matters pertaining to hospital construction and management, and his advice was widely sought. During the years of his administration he was ever the loyal and devoted servant of the hospital and of the community which maintains it. His active life was terminated only when physical disabilities compelled his retirement.

The Hospital Staff wishes to record its appreciation of Dr. Rowe's unflinching integrity and of his many years of true and devoted effort for the City Hospital, and it wishes to express its sincere sympathy to his sister in her great loss.

GEORGE W. GAY,
HENRY JACKSON,
PAUL THORNDIKE, *Committee.*

NOTICE.

THE AMERICAN MEDICAL GOLFING ASSOCIATION.—In accordance with preliminary announcement made in the *Amer. Med. Asso. Journal* previous to the last American Medical Association convention, the American Medical Golfing Association held its first tournament in San Francisco, June 21, 1915. Arrangements were then made for the organization and that is now complete with the following directors:

President, Wendell C. Phillips, New York; vice-president, James Eaves, San Francisco; secretary-treasurer, Will Walter, Chicago.

Plans are now being made for the second tournament to be held in Detroit at the forthcoming American Medical Association convention in June.

The directors have decided to list as charter members all fellows who shall have enrolled by April 1, 1916.

All fellows of the American Medical Association who play the game are eligible and may obtain the desired information from the Secretary-Treasurer, Dr. Will Walter, 122 S. Michigan Boulevard, Chicago.

Members of the British Medical Association have a similar organization for play at their annual meetings, and it is thought that this will add materially to the social interest of the American Medical Association, as it has to the British Medical Association

SOCIETY NOTICES.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY.—Adjourned stated meeting at United States Hotel, Boston, Thursday, March 2, 1916, at 11.30 A.M.

Reader: Dr. John D. Adams of Boston, whose paper was postponed from February meeting on account of small attendance.

Subject: "Diagnosis and Treatment of Spinal Affections."

For Dr. John H. Ash, of Quincy.

F. H. MERRIAM, M.D., *Secretary,*
South Braintree, Mass.

NEW ENGLAND PEDIATRIC SOCIETY.—The forty-second meeting of the New England Pediatric Society will be held in the Boston Medical Library, Friday, March 3, 1916, at 8.15 P.M.

The following papers will be read:

1. "The Amount and Duration of Fomites Infection in Diphtheria." Dr. E. H. Place, Dr. H. H. Amiral, Dr. F. D. Jones, Boston.
2. "Spasmophilia with Especial Reference to Its Treatment." Dr. J. P. Sedgwick, Minneapolis, Minn.

Light refreshments will be served after the meeting.

A. C. EASTMAN, M.D., *President,*
RICHARD M. SMITH, M.D., *Secretary.*

HARVARD MEDICAL SOCIETY.—Historical Club meeting in the Peter Bent Brigham Hospital Amphitheatre, Tuesday evening, March 7, at 8.15 o'clock.

PROGRAM.

"Experiences in a Base Hospital in France." Prof. Joseph M. Flint.

Some letters from the countries at war.

Medical students and physicians are cordially invited to attend.

ERNEST G. GRAY, M.D., *Secretary.*

SUFFOLK DISTRICT MEDICAL SOCIETY.—Surgical Section.—A meeting of the Suffolk District Medical Society will be held at the Medical Library, Wednesday evening, March 8, 1916, at 8.15.

Gall Bladder Surgery. Dr. E. Starr Judd, of Rochester, Minn., will read a paper upon "Cholecystitis with and without Stones." Discussion by Drs. Hugh Williams, W. J. Dodd, D. I. Edsall, E. P. Richardson, A. W. George, Wyman Whittemore, Halsey Loder, Franklin White, and J. D. Bottomley.

JASON MIXTER, M.D., *Secretary.*

RECENT DEATHS.

DR. CHARLES W. MORSE, who died recently at Salem, Mass., was born in that city on February 14, 1867, the son of a physician. He received the degree of M.D. from Boston University in 1889 and since that time had practised his profession in his native city.

DR. IVAN PAVLOV, the celebrated physiologist, died recently at Petrograd at the age of 67 years. He was professor of physiology at the Institute of Experimental Medicine at Petrograd. He was the recipient of the Nobel Prize for medicine in 1904.

DR. BENJAMIN F. FICHARDSON, who died of endocarditis on February 15 at Lynn, Mass., was born in Middleton, Mass., on August 23, 1863. He graduated from Phillips Andover Academy and in 1886 received the degree of M.D. from the Harvard Medical School. After pursuing his studies for a time at Berlin and Dublin he returned to the United States in 1888 and since then had practised his profession in Lynn. He was a member of the Massachusetts Medical Society.

DR. SIR WILLIAM TURNER, principal of the University of Edinburgh, died recently in that city at the age of 83 years. He was distinguished as an anatomist and physiologist and was at one time president of the general medical council of Great Britain. He was editor of the *Journal of Anatomy and Physiology,* and author of several works on anatomy and anthropology.

DR. RICHARD HENRY WHITEHEAD who died of pneumonia on February 6, at Charlottesville, Va., was born in 1865. He was Professor of Anatomy and Dean of the Department of Medicine at the University of Virginia.

DR. HENRY BAIRD FAVILL, who died of pneumonia on Feb. 20, at Springfield, Mass., was a noted practitioner of Chicago. He was president of several medical organizations of that city and chairman of Council on Health and Public Sanitation of the American Medical Association.

DR. GEORGE MASON FOSKETT, a Fellow of the Massachusetts Medical Society, died at Worcester, Mass., February 23, aged 59 years. He was a graduate of the University of Vermont College of Medicine, in 1883, joined the Massachusetts Medical Society in that year, from North Dana, and had practised in Worcester for twenty-five years.

DR. DANIEL WEBSTER WIGHT, a retired Fellow of the Massachusetts Medical Society, died at his summer home, Casco, Me., November 20, 1915, aged 78 years. He was a graduate of the Medical School of Maine in 1867, and had practised in Winchester and West Medford, making the latter town his home, for over twenty-five years.

DR. CHARLES CLIFFORD BARROWS, a widely known obstetrician, died at his home in New York recently. He was born at Jackson, Miss., in 1857.

DR. JAMES LLOYD WELLINGTON, who had practised medicine in Swansea, N. H., for 62 years and was the only survivor of the Harvard College Class of 1838 and of the Medical School of 1842, died at his home in Swansea, Feb. 11, at the age of 98 years. He joined The Massachusetts Medical Society in 1846 and was retired in 1883.